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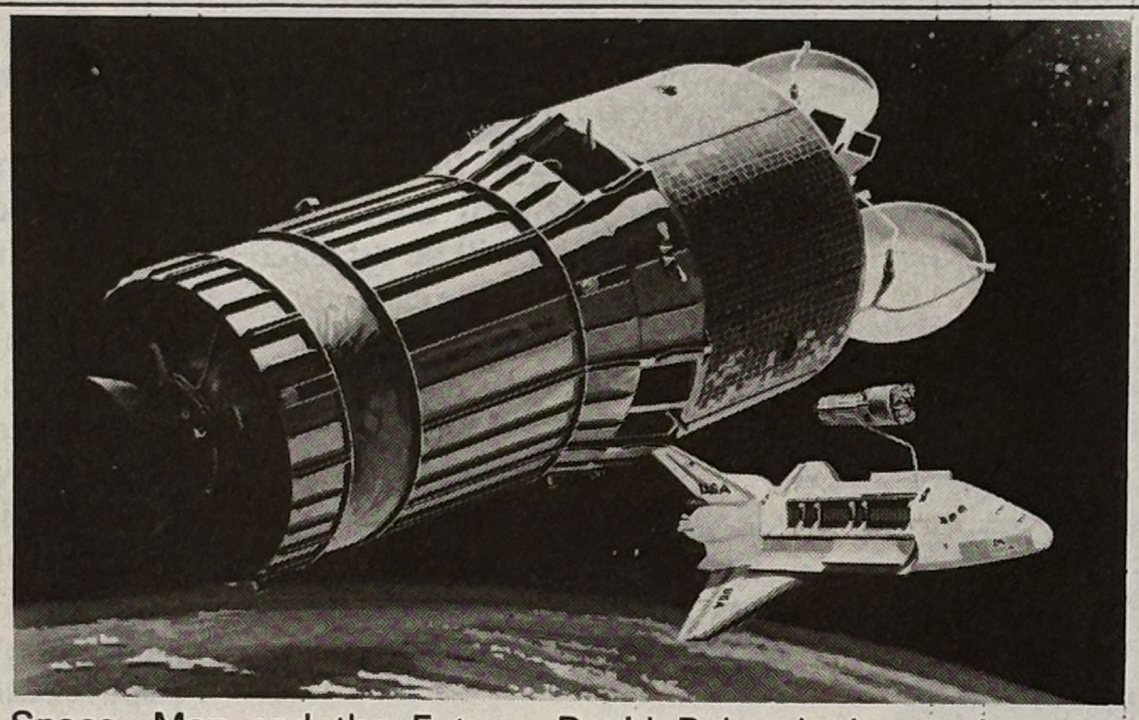
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INTRO

In this editorial, we were going to treat you to a long diatribe on how the latest budget has sent the cost of everything soaring, and the difficulties of small (but would be large) organisations in coping with the present situation. However, we felt this would smack of whining in the face of adversity, and we were also reminded of an earlier editorial which stated firmly that Ad Astra did not deal in politics. So instead the good news is that Ad Astra will continue to cost only 45 pence for the forseeable future, and we add the usual plug about telling everyone you know about it!

In the face of a continuous demand and one or two letters, edition six will feature a new innovation — THE READERS' LETTERS PAGE. This break-through in communications will be called 'YOUR WRITE'. The idea being that you can air your views on any subject or topic or even the contents of the magazine! The rider is that all long and extremely boring (editor's decision is final) letters will be savagely cut. We look forward to long and interesting exchanges of views.

The other innovation for this edition is 'apology corner'. We would like to apologise to everyone who has anything to do with the magazine for whatever reason, but the circumstances are generally outside our control. Secondly, we apologise to Elaine Turner who wrote the very interesting and illuminating review for Jurgen and A High Place in edition four, and did not get a by-line.

A word in passing, in case the ostentatious advert is missed, for our star author in edition six — Isaac Asimov. His feature is a British exclusive, and demand is sure to be high. So make sure of your copy in advance!

Enjoy this edition, and remember 'Upwards Ad Astra'.

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SPACE, MAN AND THE FUTURE

BY DAVID BAKER

From the time Earth's first artificial satellite bleeped its way round the planet, space has been a hotly contested frontier where major nations demonstratrated their technical and scientific prowess. For more than a decade after Sputnik 1 was launched into orbit in October, 1957, Russia and the United States marched together down a road of achievement and success in spectaculars designed to exploit every facet of space activity. But broadly speaking, space operations can be divided into two prime categories: applications and exploration. The 1960's were a time of competition and bold steps in new directions; the 1970's showed what man could do in space freed from the need to demonstrate political will; the 1980's will open a new age of space industrialization every bit as significant as the first use of factory machines on Earth more than a century ago.

Central to an expanding commitment in space is the Space Shuttle, subject of the previous article, and highly relevant to both applications and science. As now envisaged, the Shuttle will provide opportunity for accomplishing in orbit what has hithereto been impossible from the surface of our planet:drawing an accurate inventory of the Earth's resources; monitoring pollution on land, at sea, and in the air; accurately charting the course of inclement weather systems that threaten to blossom into hurricane or tornado; provide global communications for everybody, not just the few; and aid food producers to maximise the efficiency with which they harvest crops by timely warning of blight and disease. But more than all of this, when fossil fuels run out, probably in the early decades of the 21st century, space industrialization will provide the means by which teams of orbital spider—men could erect giant girder structures on which large solar cell arrays could be laid out, effectively turning sunlight into electrcity; beamed to Earth as microwave energy, electricity thus transmitted would replace all Earth based power stations.

Yet the Shuttle is essentialy a low–orbit transportation system, a means by which cargo up to 29 tonnes in weight can be lifted to altitudes not exceeding about 400 km. Most application satellites, the largest single group of potential Shuttle payloads, will need to reach geosynchronous orbit, a point nearly 36,000 km out where one complete revolution of the Earth takes 24 hours; seeming to remain stationary in orbit above the Earth, payloads placed here can view large areas on a continuous basis. Application satellites destined for geosynchronous orbit will be carried in the Shuttle's voluminous cargo bay attached to a solid propellant rocket stage, selected from several different types to serve the needs of that specific payload. Satellites weighing no more than 1,100 kg will be served by an SSUS–D–a Spinning Solid Upper Stage equivalent to the lifting capacity of a conventional Delta rocket; payloads up to 2,000 kg will be attached to an SSUS–A–equivalent to the capacity of an Atlas–Centaur. Each SSUS will be spin–stablized; that is, they are set revolving so that when released they maintain an accurate course like a rifle bullet from a gun. If the payload is particularly sensitive, requiring an attitude–stablized control system, an Inertial Upper Stage (IUS) is adopted. Available in up to four different versions to suit the mission for which it is selected, IUS will be capable of sending a maximum 2,270 kg to geosynchronous orbit, or of accelerating 540 kg to escape velocity and a course for the outer planets.

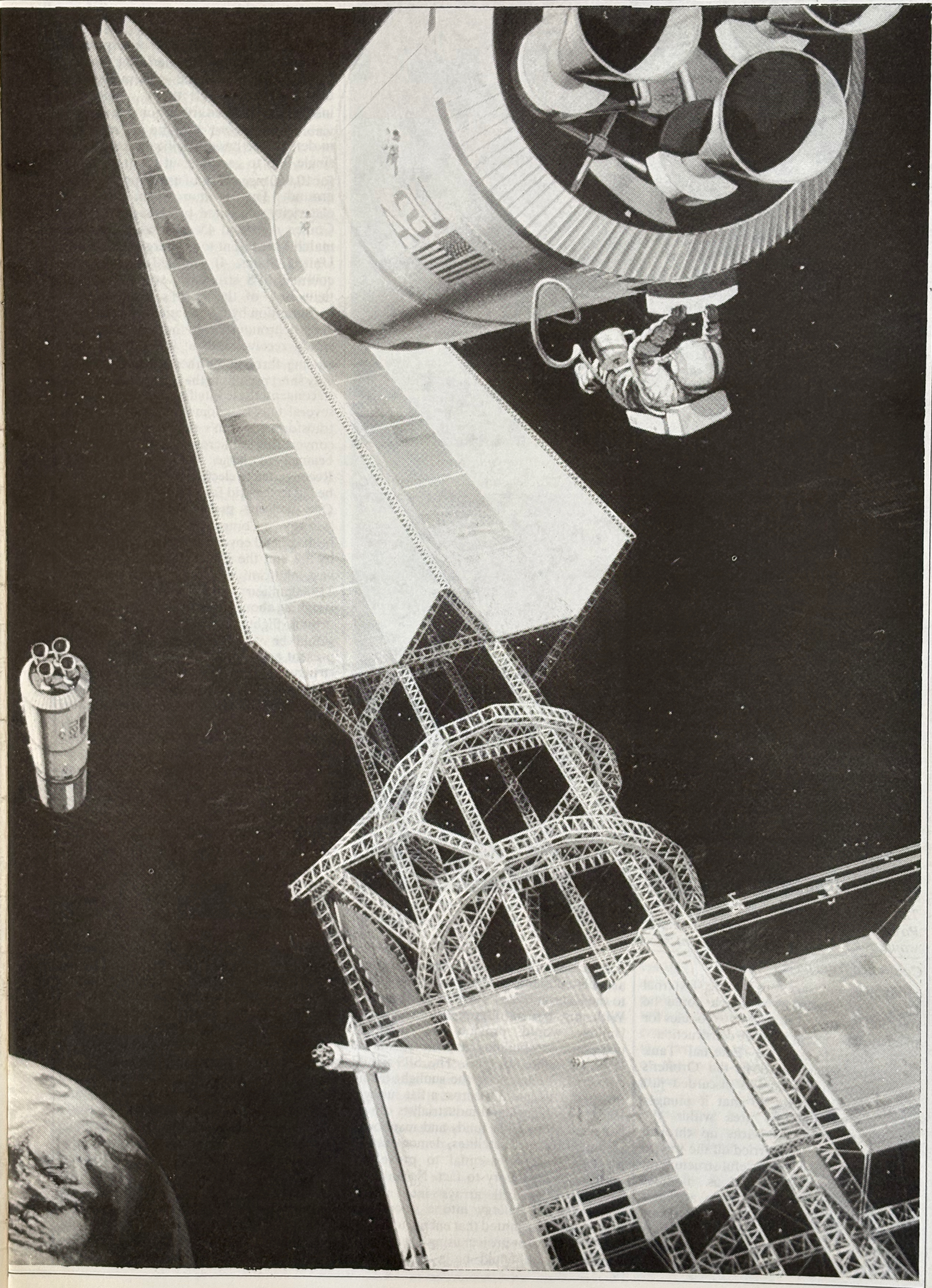
With two types of SSUS and up to four different configurations of IUS to choose from, Shuttle customers will have an inventory of six supplementary propulsion systems capable of accommodating a wide range of missions. Combinations of several such systems will be common when the Shuttle begins commercial operation. Two or three SSUS payloads can be carried in the Shuttle Orbiter cargo bay, each combination of propulsion system and payload attached to a separate spin table. Pitched up at an acute angle to the centre–line of the cargo bay, the spin table imparts a rotation to the combined assembly before ejecting it from the Orbiter. On its own, the propulsion system fires to accelerate the payload to geosynchronous orbit. Inertial Upper Stage units will first be carefully removed from the cargo bay, the combined IUS and payload gently ejected by springs from a table tilted at an angle to the cargo bay. Under the control of its own attitude stabilization system, the assembly will fire up its large solid propellant motor when the Orbiter has drifted to a distance of a least 18 km.

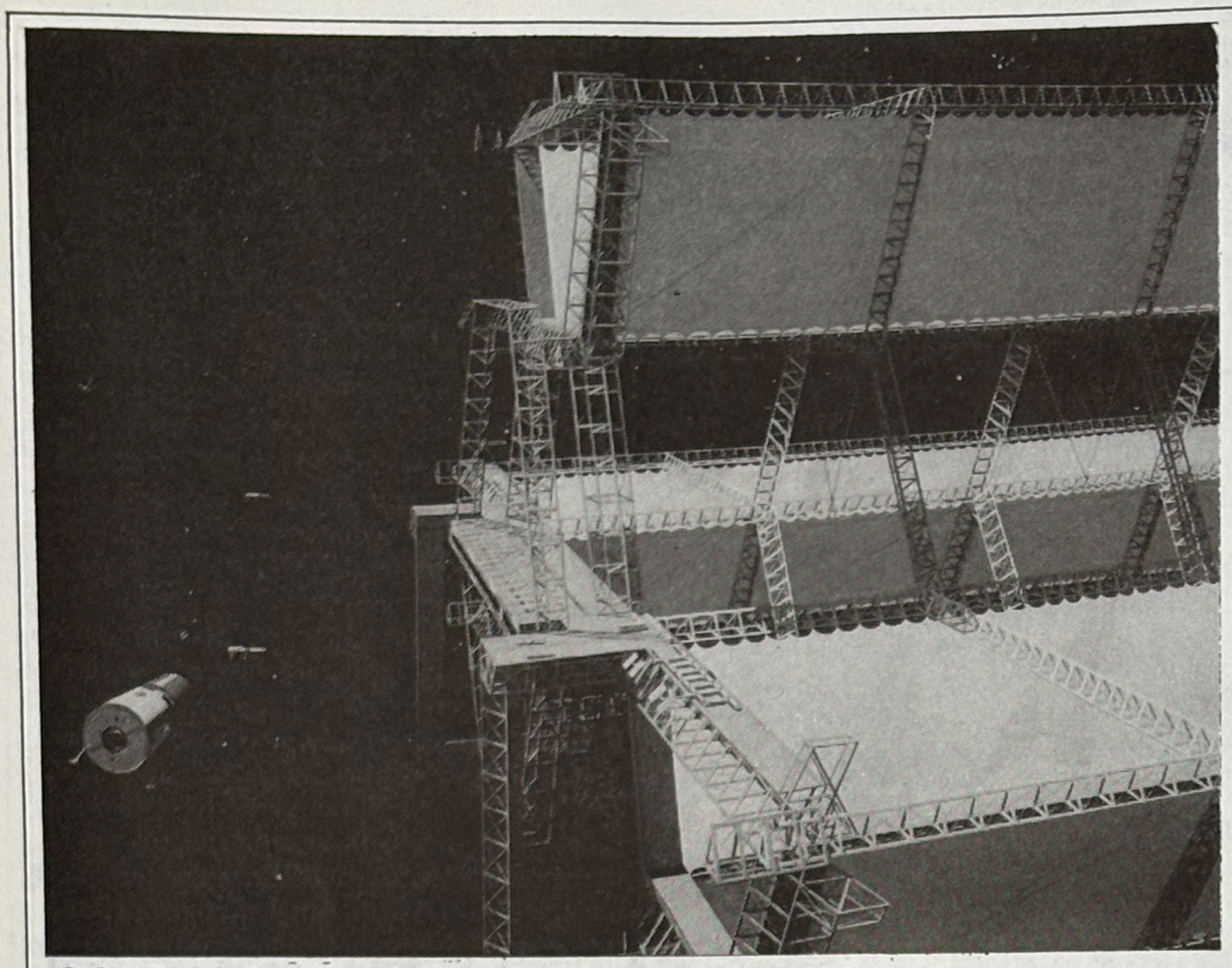
In this way, using one or other of the several alternatives provided, application satellites can be delivered to their geosynchronous destinations and, because each Shuttle Orbiter can carry several combinations in its cargo bay, the operating economics are further enhanced. Application satellites and the need to meet launch requirements of foreign and domestic customers will keep the Shuttle busy in the early years of its development, doing essentially the job expandable launchers have been employed upon in recent years. Since publication of the first article in this series, several minor delays have accumalated to postpone the Shuttle's first flight from November this year to about March or April, 1980. It is important to recall that every other manned spacecraft (Mercury, Gemini and Apollo) was also delayed in getting off the ground, and by a period of time greatly in excess of the 12 month slip experienced by the Shuttle. However, the first Shuttle equipped to fly in space, called Columbia, is expected to fly six or seven test missions in which every conceivable aspect of its broad operational envelope is demonstrated and evaluated. After that, in about mid 1981, Columbia will be available for fully operational duty with fee paying customers.

Shuttle flight assignments require Columbia to make the six test missions between about March 1980 and April 1981, and the first six operational flights before the end of 1981. In 1982, Columbia will perform about 15 fully operational flights with at least 20 in 1983; by 1986 Shuttle vehicles will regularly support an annual average of 45 missions. A second Orbiter, called Challenger, should be ready to join Columbia in the spring of 1982, with the third, Discovery, completed by early 1984 and the fourth, Atlantis, ready in 1985. By that time, NASA will be ready to embark on what many belive to be the most dramatic potential yet provided by the space programme: the full scale industrialization of Earth orbit.

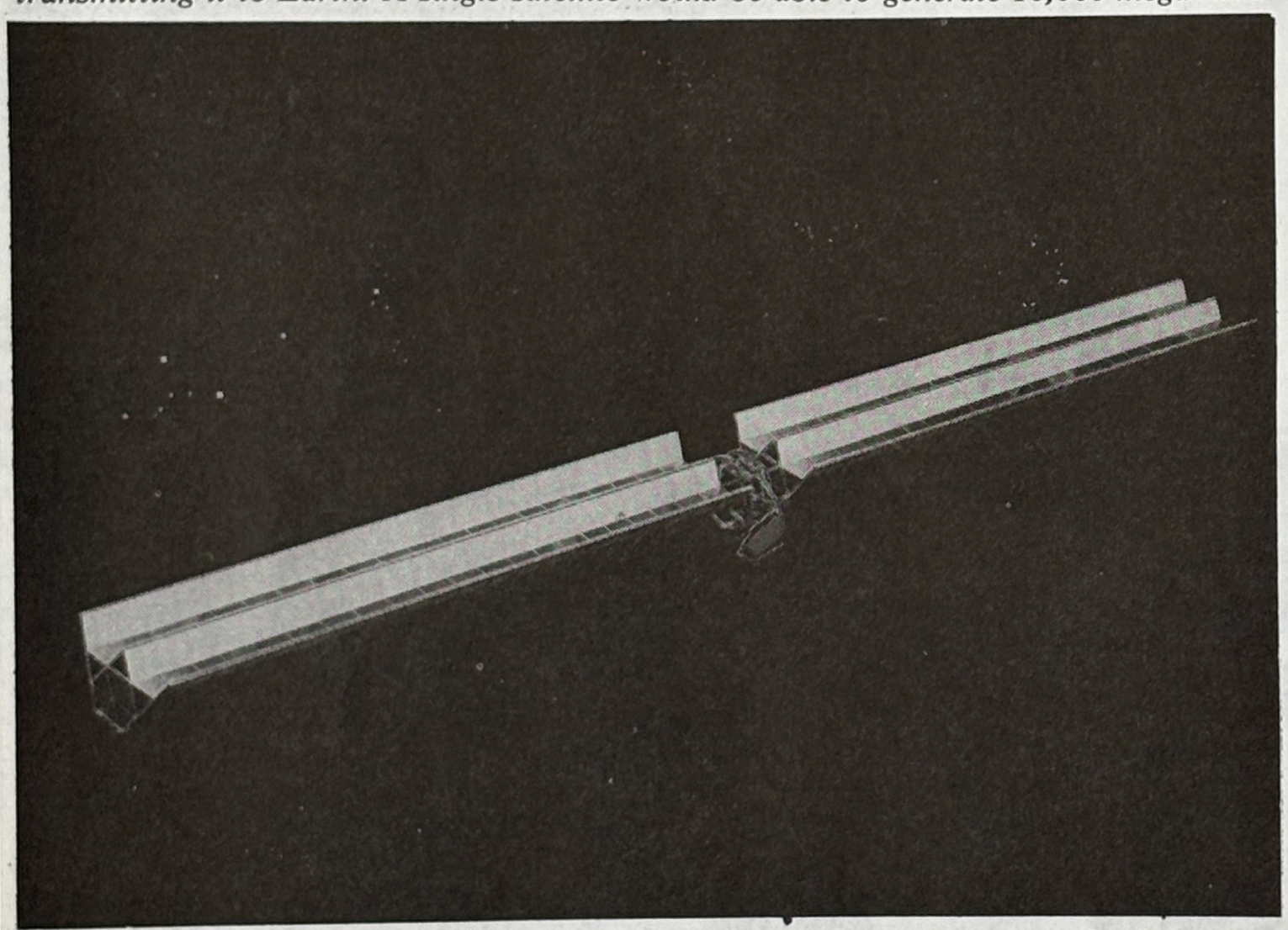
Early Shuttle flights will test a unique construction tool called the Beam Builder, produced by Grumman Aerospace and capable of accepting rolls of aluminium at one end and disgorging fully assembled girder structures at the other. In this way the comparatively low density of open–work girders will permit several kilometres to be assembled with the aluminium carried in the cargo bay of a single Shuttle flight. This brings very much nearer the day when massive structures can be put together by workers living in habitability modules, each module carried up by Shuttle and docked to others in a stable configuration. One plan now being examined by NASA as a result of studies conducted by several aerospce

Continued on page 6





Solar Power Satellite effortlessly collecting the energy from the Sun, and transmitting it to Earth. A single satellite would be able to generate 10,000 megawatts



The start of continuous energy for the Earth demands the construction of a Solar Power Satellite. Pictures on page 5 and top 6 show in detail how this building work would take place, and the equipment needed.

Continued from page 4

companies envisages using the External Tank as a platform to which could be attached cargo and habitability modules for an early experiment in space construction.

In normal use, the External Tank carries propellant used in the Orbiter's three main engines and is discarded just before reaching orbit so that it plunges back into a planned area within the atmosphere where it burns up through friction. However, if carried all the way to orbit it would provide a useful structure on which to attach the various modules necessary for practising the many activities essential for large construction projects. One or two modules would provide living quarters for a small work force, others would serve as cargo containers with food and essential supplies, and a small articulated manipulator arm could be fixed to the External Tank's cylindrical structure. With this, girders disgorged from a Beam Builder would provide the materials necessary for building a prototype Solar Power Satellite, or SPS. The SPS would convert into electricity the sunlight falling on solar cells laid out across a flat surface. Before politicians and industrialists can be expected to provide funds and manpower resources for such satellites, demonstration projects will be essential to prove the application of theory to fact. Nobody has yet put solar cell arrays into space, converted the energy into a microwave beam, and transmitted that energy to Earth. A small scale test project using a redundant External Tank could be a key part of generating the necessary support for a full–scale system.

But thoughts of SPS test projects, External Tanks used as platforms for small work forces, and demonstration transmission of electricity, pale into insignificance when the requirements for a viable Solar Power Satellite are examined in detail. The basic specification requires a single SPS to generate sufficient electricity for 10,000 megawatts of usable power on the ground. This is more than twice the electricity generated by America's Grand Coulee dam and 45 such satellites would match the present total energy needs of the United States. If adopted by no other country, SPS structures would free more than 30% of the world's fossil fuels for consumption by other nations. Deployed in geosynchronous orbit the SPS assemblies would receive sunlight 99% of the time, passing through Earth's shadow only for very short periods in the spring and autumn. In concept, these satellites – giant structures several tens of kilometres square – would transform the Sun's rays to electricity and convert this to microwaves which would be beamed to large antennaes on Earth. Reconverted to electricity, this power would be fed to the grid for normal distribution.

One concept proposed by the Boeing Aerospace Company would be rectangular in shape and cover an area of about 24.8 km by 5.2 km, the size of a small city. On this vast platform would be mounted about 14,000million solar cells, a structure weighing about 100,000 tonnes. Of course in orbital flight the Solar Power Satellites would be weightless, but inertia is still present and trying to stop a 100,000 tonne structure is just the same as bringing a massive oil tanker to a halt: SPS structures could be constructed in low Earth orbit and moved slowly up to geosynchronous orbit, with all the attendant problems of starting and stopping such a colossus, or they could be assembled at geosynchronous orbit from the beginning. Either way, the logistics problem is enormous. If 45 structures were to be assembled, transporters would have to move nearly 5 million tonnes from the surface of the Earth; compared with this requirement the Shuttle's 29 tonne lifting capacity seems ridiculously undersized. But nobody suggests that Solar Power Satellites are feasible for a least 10 years, or that the current Shuttle would be the most appropriate transporter. Instead, the coming decade provides unique opportunity to test projectd concepts, determine which are the most efficient, and demonstrate the selected method.

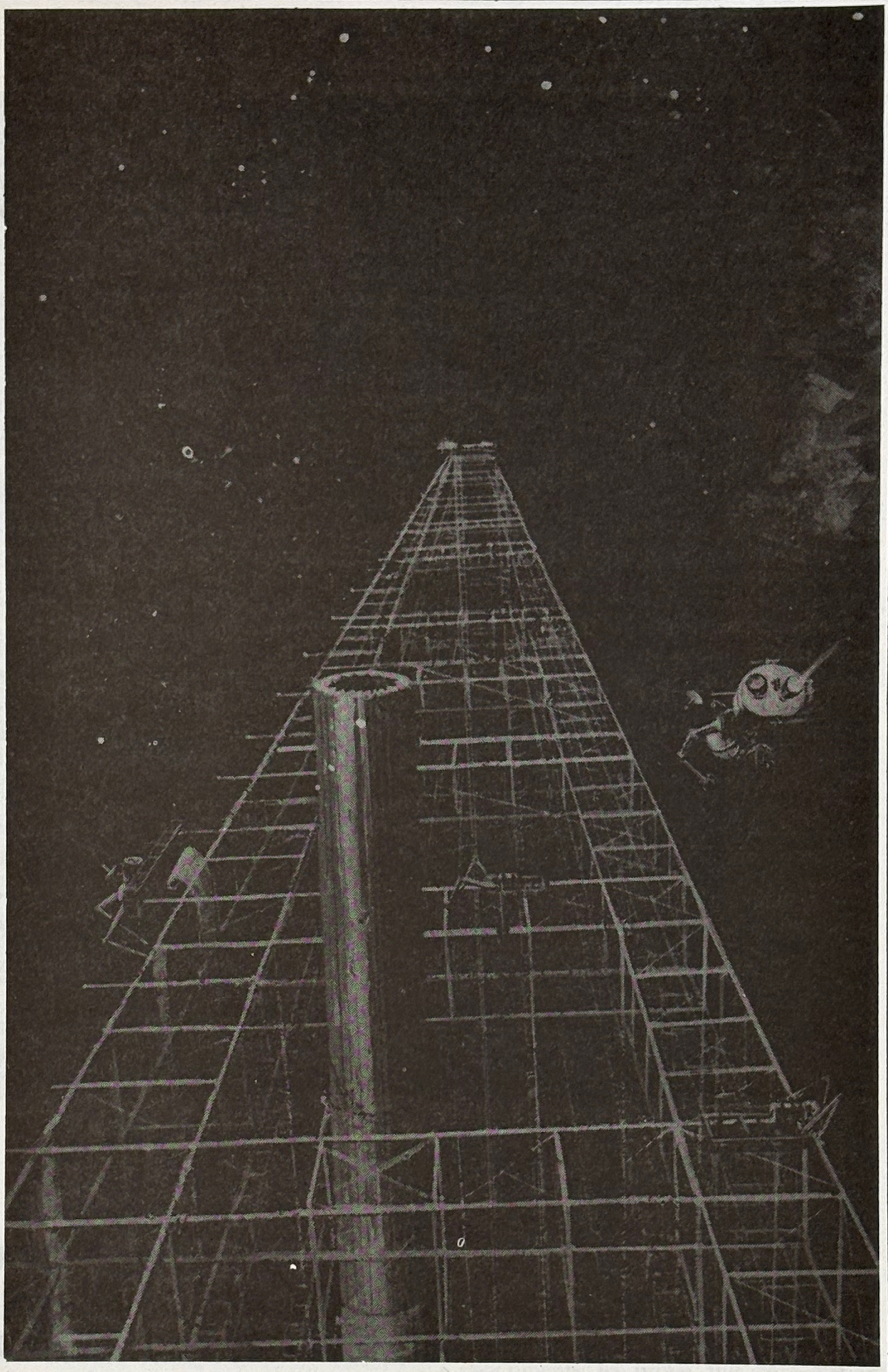
Using the Beam Builder to fabricate in space the girder assemblies upon which large structures would rely, and by developing a limited work capability based on the availability of an External Tank, NASA would like to move during the 1980's into a position from which massive Solar Power Satellites could evolve. As viewed at present, we probably have 10 years to select our options, 10 years to choose the best design concept, and 20 years to construct a Powersat capability, before critical levels of fossil fuel threaten political stability and national capacity. The first step would be to develop several supplementary vehicles

essential to orbital construction. One of these would be a Manned Remote Work Station, also known as the Cherry Picker.

The Cherry Picker has been designed by Grumman with heavy construction tasks in mind. It would comprise a bulbous crew compartment attached to a cylindrical propulsion module. Equipped with manipulator arms, it would support two men for a full workshift, carrying them to and from the assembly area and providing equipment with which to fabricate and move the girders essential for building a test SPS structure. At the beginning of the working 'day', two assembly workers would leave their habitability module, enter the Cherry Picker's pressurised cabin, seal it up and de–pressurise the hangar alongside. Moving across to the SPS structure, the Cherry Picker would fix itself to a supporting beam by grasping the girder with a long arm. Two other manipulators would be employed to remove newly fabricated beams and transfer them to the position they would occupy on the SPS. Another Cherry Picker, flying around the fixed companion, would use its manipulators to secure the beams. At the end of the shift, the fixed Cherry Picker would release its grasp of the support girder and fly back to the hangar. A day's work done, the crew would relax in the recreation room of their habitability module, seeing 16 sunsets every 24 hours.

In one plan now being examined by NASA, a prototype Solar Power Satellite capable of delivering 2 megawatts of electrical energy to the ground could be on test in geosynchronous orbit by 1987. The Beam Builder, habitability modules, the Cherry Picker, and Space Tugs would be essential for the next major step. Space Tugs would be employed moving sections of a large Solar Power Satellite from remote work locations to the central assembly area. With pressurised crew compartments arranged like the flight deck of an airliner, Tugs would carry large liquid propulsion systems for slowly moving massive structures from one orbit to another. Precursor test versions of the SPS could be built at one location; larger assemblies would need dispersed construction sites. Tugs would be an important element in the growing inventory of equipment unique to Earth orbit fabrication.

For at least the next 25 years NASA will be committed to major Earth orbit space operations, hopefully getting permission from the government to mount a Solar Power Satellite test project by the mid–1980's and perhaps by 1990 the clearance to begin constructions of a full size structure. It is difficult to say when flights to the Moon will resume, almost impossible to predict when Man will get to the nearer planets. With unmanned planetary exploration a period of at least 5–8 years is necessary for development, construction and launch. Already, plans are laid for projects to begin within the next five years carrying NASA through to the 1990s. If anticipated budgets are adhered to, NASA will probably get the chance to return soil samples from the surface of Mars to Earth in the early 1990s. But certainly not before. And that may represent the most ambitious planetary mission this century. So what are the long term prospects for the space programme? And are we going to remain in the vicinity of Earth for the forseeable future?



An arm of the giant structure which when completed would be the size of a small city, and weigh about 100,000 tonnes. Such satellites could free 30% of the world's fossil fuels for consumption by less developed countries.

Confience is high that the economic use of Shuttle services over the next few years will inspire a generous look at what orbital flight could provide in the form of abundant energy; Solar Power Satellites are a logical step beyond the era of fossil fuels, those planetary resources that bind us with an umbilical of dependancy on rapidly diminishing reserves. Although the Shuttle will be incapable of supporting the massive transfer of men and materials the SPS task would require, it is no coincidence that a shuttle replacement will be necessary by the time such large scale structures become feasible. NASA and the American aerospace industry is already looking at post–Shuttle launch systems, delivery vehicles for the closing decade of the 20th century. What emerges as a replacement for this first reusable launcher depends largely on the traffic needs of the 1990s. If Solar power Satellites are commissioned NASA will need a lifting system capable of transporting more than a million tonnes each year; if not, a system with just twice the Shuttle's capacity would probably suffice.

Assuming a decision to build a flotilla of 45 Solar Power Satellites, the optimum number for space–dependant energy requirements in the United States, space freighters would be required capable of

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ILLUSTRATION BY JESS ARTEM

EINSTEIN AT BERNE

by Geoff Ryman

The old city of Bern looks much the same now as it did in 1905, especially in early morning, in mist. The silhouettes of the roofs are unchanged, and the hills around the city have the same, flat, golden shapes. The spires of the churches, the cathedrals, and the government buildings still form long snakey lines down the promontory, towards the river. The yellow, respectable houses, and the awnings over the cafes, and the window boxes are still there, and the fountains and the old city gates. The famous clocktower is surrounded by postcard shops, but all along the Kramgasse, with its 15th century arcades, the dull floating echo of its chimes still sound.

A small, rather fierce looking man waited on a wooden bench. His neck bulged over the top of a fresh shirt collar, as if with indignation. His suit was dark and sober; light reflected on his thick spectacles with the thin, black rims, and his back was ramrod straight. He clutched beside him a scuffed, rather worn leather satchel.

He sat in a long, narrow office, painted an institutional off–white. Facing him was a counter, and beyond that, two cramped rows of desks with barely an aisle between them. A civil servant was striding down it, wearing a rather loud lime green suit with brown checks. With a lick of his finger, the civil servant pulled an application form out of a varnished wooden tray, and read out a name.

'Signor di Bolsano?' he asked in a sonorous voice, looking at the man on the bench.

Stiffly, with a start, Signor di Bolsano stood up. A gate in the counter was held open for him, and he followed the clerk to a desk, where he was motioned to sit down. Heavy technical texts and files tied with tape covered the desk; breadcrumbs littered it. Absent–mindedly, the clerk swept some of the crumbs aside. As he studied di Bolsano's application form, di Bolsano studied him.

The clerk's left shirt collar was crumpled, and his tie had not been pulled all the way up to the neck. He had a plump, soft face that was lacking, di Bolsano decided, in Strength. Di Bolsano was a great believer in Strength. He liked a fellow who glared out purposively at Life. 'Gentle. Meek,' di Bolsano decided. He noticed the man's brown skin and curly hair and mentally added, 'Jew'.

'What is it that you wish to patent, Signor' asked the clerk. 'You have left the space blank.'

Di Bolsano, both hands resting on his knees, made a deprecating gesture, and did not answer.

'I cannot help you patent your device unless you tell me what it is,' the civil servant said, not illogically.

Di Bolsano was not sure he wanted the clerk's help. He did not look important enough. And it would not do to tell every petty bureaucrat in Bern about his discovery. There was, after all, the very real danger of theft.

'I do not know who you are,' said di Bolsano, with a little shake of his head.

'I am Herr Einstein,' replied the clerk, simply. The Signor remained unmoved by the information. 'I am a Technical Officer. It is my job to make a detailed report on your invention.'

'And who will I see after you?'

'No one,' replied Einstein. 'Herr Haller will read the report and come to a decision. He is not here now. You are welcome to talk to someone else, but they will be Technical Officers, like myself.'

Di Bolsano looked round at the other clerks and sniffed. Well, if he was going to talk to any of them, it might as well be this one. 'I have invented,' he said in a lowered voice, leaning forward, 'a perpetual motion machine.'

Einstein hid the line of his mouth for a moment with his index finger, then cupped his hands on the desk, and said, 'That would indeed be a very great advance. Do you have a working model?'

'No,' replied di Bolsano. ' I wish to attract investment after the device is patented.'

'Ach!' exclaimed Einstein. 'I am sorry. But I must see a working model. It is the regulations.'

'I have drawings,' said di Bolsano coldly.

'I am afraid drawings alone are not sufficient to secure a patent.'

'I have come all this way. I have climbed three flights of stairs. I have waited nearly one hour. The drawings wil be sufficient for you to at least begin your report.' Secretly, di Bolsano was convinced that most patents were secured by Strength, not by working models.

Einstein began to smile. ' Very well,' he said, and waved for the drawings to be passed to him.

Di Bolsano began to smartly unfasten the straps of his satchel. 'The device works on the principle of electricity,' he anounced, and passed Einstein a sheaf of tidily folded drafting paper, of the most expensive sort. 'The needle will have a negative charge, and will bounce back and forth between two positive poles.'

Einstein unfolded one of the drawings and shook his head. It was hopeless, hopeless, worse than he had imagined. He had hoped to send the peculiar little man away to build a model that would never work. But really, what was the point of that?

'It won't work,' pronounced Einstein, and passed the drawings back to him. 'I am sorry, Signor.'

'But you have not even looked at them!' protested di Bolsano, outraged.

'I don't have to,' replied Einstein. 'Perpetual motion is impossible, Signor. It is a law of the universe. To do work requires energy. What you are trying to do is invent a system that returns all the energy back to its original state. This is impossible, because every time work is done, some energy is lost as heat. Which simply radiates away. So your system eventually no longer has enough energy and it stops.'

'These laws,' chortled di Bolsano. 'They are made by men. Not by God. Men can be wrong.'

'Yes indeed, men can be wrong,' agreed Einstein. 'The miracle is, though, that sometimes they are right.' There was something benign, impersonal, and utterly immoveable in his gaze. Di Bolsano didn't like him.

'You obviously have a closed mind and a limited intellect,' judged di Bolsano, tapping the edges of his drawings against the desktop. 'I shall return, with my working model, and when I do, I will talk to Herr Haller. Good day! You will forgive me, but I have forgotten your name.' With that di Bolsano rose and swept out of the office, leaving the gate in the counter to swing back and forth behind him, until it stopped.

'Biedermeier makes another friend, joked one of the clerks. He was tiny and bearded and gaunt; strings of muscle circled his mouth as he smiled.

Einstein chuckled too, shaking his head, 'Yes, I know, it is very sad, but what else was I to tell him?'

'You are in the wrong line,' said his friend.

'Ach! I know.' said Einstein, reaching for di Bolsano's application.

'No, I mean you ought to be disproving the 2nd Law of Thermodynamics. We could have perpetual motion then.'

'I wouldn't do that,' sniffed Einstein, as he wrote. 'The 2nd Law of Thermodynamics is correct.'

'I thought you told me nothing is certain. How are you sure of that?'

'Well,' said Einstein, dropping the application with relief onto one of the piles on his desk. 'I ask myself, if I were God, would I have made Thermodynamics. And the answer is yes.' The two men grinned at each other.

Herr Bladen, balding, with soft blond hair, watched them both.

God in Heaven, who did Einstein think he was? Lecturing applicants like that, talking about the laws of God as though he were privy to them. Herr Einstein, degree in physics from the Zurich Polytechnic, indeed! For all the good that did him. He certainly was no engineer, his reports showed that, but at least for a while, he seemed to be settling into the job. Now this Besso fellow was encouraging him. Honestly, you would think the two of them were married, the way they hunched over their lunches together, discussing the Infinite. And there had been papers found, covered with equations. Einstein was doing his own work in the office again. It was no business of his colleagues, but sooner or later Haller would discover it. Herr Bladen had the satisfaction of thinking that, for all his degrees and equations, Einstein was still, after three years, Technical Expert Third Class, and was likely to stay that way.

● ● ●

It was half past six in the evening and still light, and the baby was sleeping, so it was quiet. In his study, with portraits of scientists instead of icons on the walls, Einstein worked, at a desk that was heaped with paper. He was writing the introduction to an otherwise completed thesis.

The first sentence of it read, with crossouts:

The Kinetic theory of gases made possible the earliest determinations of the actual dimensions of the molecules, whilst physical phenomena observable in liquids have not, up to the present, served for the calculations of molecular dimensions.

The idea had come to him while he was drinking tea. He had been watching a cube of sugar dissolve in it, through the thick, clear glass of the cafe cup. As he looked at the sinewy swirls of sugar move through the tea, he had a sudden sense of the sugar physically displacing it, a sense of changing boundaries. And somehow he knew it was possible, from the changes in motion and viscosity of the fluid, to calculate the size of the sugar molecules. It only remained to find out how.

His strategy was childishly simple. He treated the molecules as though they were large, simple spheres. Using the equations of hydrodynamics, he then described, mathematically, how these spheres would affect the liquid through which they moved.

Calculations filled the backs of envelopes, and the scruffy notebook he always carried rolled in his pocket, or the back of office memos. And through all the equations, from the very beginning, darted P, magic P, the radius of the sphere, like a fish eluding the fisherman, like gold in solution refusing to be isolated, as he substituted new terms, reduced, expanded.

There were hideous problems. Molecules are not, after all, simple spheres, and liquid is itself a structure of molecules. At one point, he calculated that a gram of sugar had the same effect on the viscosity of water as spheres of a total volume of 0.98 cc. The total volume of a gram of sugar is 0.61 cc. Einstein simply postulated that some of the water was sticking to the sugarmolecules, increasing their effective volume by nearly a half. He carried out no experiments to prove this, nor did he suggest any. He simply showed how, mathematically, this was possible.

Finally he obtained two equations that, together, allowed him to calculate P.

By substituting the known values for the viscosity of a sugar solution, he calculated that the radius of a sugar molecule was 6.2. 10^{-8} centimetres.

N, almost incidentally, was equal to $3.3. 10^{23}$. N represented the number of molecules.

Einstein surveyed his work and rested for a moment, allowing himself a private smile of pleasure. It was a pretty little watercolour of a paper, he reflected, with modest aims. What he liked about it was its conciseness. It was as concise as Mozart. The equations leapt from main point to main point and the beauty of them was what they left out, the pages of calculations between them.

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The paper was to be his Ph.D thesis. That it demonstrated his mastery of mathematics, he was well aware. It also showed, at the very least, a working familiarity with physical principles. What more could one ask of a graduate thesis, which was not, after all, supposed to be one's crowning work. The paper's modesty was its protection. Being immodest had never got him anything before from the professors.

The last paragraph of the paper read:

The value found for N agrees satisfactorily in order of magnitude with the values obtained by other methods for this quantity.

That last sentence was a satisfied sigh of work completed, a tidy capstone set on the pyramid.

It was also a joke.

N was a constant, Avogadro's number—the number of molecules of a gas in a certain standard volume, under standard conditions. The first man to find a reliable value for it had been Planck, Planck of the quantum hypothesis. Einstein had found another way to calculate it.

But why tell everyone that? N performed its function in his little paper, it confirmed P. Let N steal up on the professors as a surprise. Besides, to let Avogadro's number come crashing in at the very end of the paper would throw off centre the whole delicate balance of its structure. As it stood, the thesis was poised and elegant and simple and clear.

It was, as he knew, a work of art.

He rolled up his sheets of calculations and jammed them into a pigeonhole, and began, immediately, to leaf through a different set of papers.

He worked under a pressure now, a kind of bubbly nervous agitation that he had never known before and would, sadly, never know again. He could feel his future crowding in around him. The shapes of it were hazy and heavy and hot and lined up in a kind of order. That was the only way he could control them. If he approached them too closely, they would suddenly come clear, out of sequence, after ten years of thinking, and he would have to stop everything, short of life itself, to fix them all on paper. 'One at a time. One at a time,' he murmured, calming himself, his shoulders hunched. This next paper would also use his large simple spheres in fluid. This time they would prove finally, even to the old doubters Mach and Ostwald, the existence of atoms.

Ten years of thinking. In lectures, in the street, in the mountains, at the opera during Parsifal, in the drawing room of Mileva's parents, or when he should have been remembering his key. He had been only sixteen years old when he first asked, in a paper to his uncle Jakob, what a light wave would look like to someone keeping pace with it.

Once, in the really bad days after Zurich, when no one would give him a job, when Ostwald would not answer his letters, and his professors laughed up their sleeves, he had turned and asked the atmosphere if he was actually willing to starve for his work. And the answer came back, from the air all around him, a surprising 'Yes'. After that he never doubted it, or himself.

On the desk, beside his elbow, was a cup of tea.

Tea? Tea? How was there tea, there by his elbow?

'Ach!' he exclaimed to himself in dismay, and dipped his finger into it. It was tepid. Under the circumstances, he knew, it was a peace offering. The tea Mileva offered him was always cold by the time de drank it.

● ● ●

Outside, in the hall, Einstein's wife leaned with her back against the study door, as if to barricade it. Her intelligent eyes and flared nostrils always gave her the appearance of incisiveness, but in profile, her plump soft face still looked girlish and vulnerable. Now she stared ahead, in rage.

For convenience, he had married her. For convenience, she saw that now. Someone to collect his socks and cook his food and occasionally dust the furniture. He would have been happier with a paid domestic, someone he could ignore and send home when her work was done. He didn't love her, there was no love in him, not even for his own son! She had seen him, mechanically rocking the bassinet with one hand, while the other scribbled away at his bits of paper. God, his papers! The thought of them made her sputter with amusement and rage. They spilled out from the desk, over the floor; they sprouted like weeds. They had taken over his whole life, those bits of paper. No wonder they were not so fond of him at work, his real work, though he would not have called it that. Twenty six, and still a third class clerk. They had given him one rise in three years, and that had been barely enough to pay for young Hans Albert. Twenty six and —what was it, four? five? Five then. Five papers published in Annalen der Physic. Which was fine for him. And what of his wife? And what of his child? It would be nice to be able to afford a servant to help with the heavy work, it would be nice enough, God knows, to spend an evening in a cafe again. And the rooms were small without windows and the stove smoked, and there was no air or good furniture, and everything was covered in soot, and he never, never said thank you, or looked up at her and smiled.

Her marriage, she realized, was dead.

In the bedroom, the baby began to cry, and so did Mileva Maric.

The floor tiles were wet from being mopped, and sheets and diapers were strung across the hall. They would not dry. The front door of the apartment was propped open, to let in some air. Anyone walking past on the landing would see her, weeping in her own apartment, with the study door closed against her husband, while the baby cried untended. For just a moment she did not care.

Then suddenly, savagely, she stepped forward, slashing at the cold, clammy sheets with her hands, pushing them aside. One of them slipped off, onto the floor, and with a snarl she picked it up in a ball and shoved it back onto the line. She burst into the bedroom and hoisted the child from its crib, and it screamed even more loudly. She pushed it against her shoulder and patted it smartly, and it sensed her rage, and was terrified.

Now look at what he had made her do! 'Baby, baby baby,' she murmured, sweeping stray hair back behind her ears. It was no good, she would have to calm herself, to calm the baby. Pressing her lips together, she forced herself to sit on the bed. She began as gently as she could, to rock the child, her cheek against its head, her eyes staring ahead. To herself, she was repeating over and over, her name.

Mileva Maric. Mileva Maric.

They had thought her a dullard at Zurich. Perhaps they had been right. She had wanted to be a physicist too, she had studied too, and wanted to do research. But beyond a certain point, she could not follow; it was the maths that had done it. Equations and formulae were not tools for her, she could not take hold of them. She had failed her exams. Well, what else could you expect, they had thought, from a women, and a Slav at that? His family had thought her mousey and dull and modest. His friends asked him in low voices why on earth he had married her, and murmured that she walked with a limp. Well, he was a Jew. She had made sacrifices, too, in marrying him. But she had always known that he was more beautiful than she.

And he had been beautiful.

Careless, rakish, innocent, telling the professors exactly what he thought of them. Weber hated him, Weber who had arranged for his entry to the school. He refused, or perhaps more simply forgot, to call them by all their titles. She had admired him for it. Together, they had been the black sheep of the class, always off to musical evenings, where he would play the violin.

And he was beautiful now, even now. His face was rounder, and the eyes sadder, but still brown and sweet, deeply sweet and faraway, as though angels were whispering in his ear. And the way he kept his pen clipped to the collar of his sweater; or the way he leaned back in the sofa, using his arm as pillow, smiling slightly as he thought, smoking one of his awful cigars; and the firm way he held a jug of milk; and his strange, clear handwriting. It was all of a piece. Everything about him fitted.

It was a beauty she could not touch. It was a beauty that was not given to her, or directed at her. It was a beauty that looked through her. And she was trapped with it, and with herself, and it was hell.

God, she hated her life.

In the next room, Einstein saw a way, and felt the power in him. 'Ah yes,' he murmured, knowing yet again how to begin.

'Ideas,' he said, later in his life, 'come from God.'

Einstein's thesis, 'A New Determination of Molecular Dimensions' was submitted to the University of Zurich in April of 1905. It was rejected on the grounds that it was too short. Einstein resubmitted it with the addition of a single sentence. In August, it was finally accepted, two months after Annalen der Physic received his first paper on relativity.

The following year, he was promoted to the rank of Technical Officer; Second Class.

H.G. WELLS
the author as inventor

by GWEN TILLEY

During the First World War H.G. Wells made several visits to the Front as a war correspondent. In witnessing the horrors of the war, his memory retained the harrowing journeys made by Ration and Supply parties who were constantly exposed to snipers bullets, attacks by wolves, being caught in cross fire, becoming entangled in half submerged barbed wire, and risked stubling into shell craters and stepping on land mines in the desolate bog land that lay between the supply centres and the trenches.

Once in the Forward areas they then had to tread warily along Duckboards linking the Trenches, which, due to continuous rain on the battle scarred terrain, were often water logged with the result that Ration and Supply party soldiers frequently slipped off Duckboards with little chance of escaping the muddy ooze that engulfed them and their heavy packs in the trenches.

During one stormy night in 1917, this nightmare scene haunted H.G. Wells as he lay in bed unable to sleep, but the grim recollection was followed by a brilliant idea which could cut the horrifyingly high mortality rate of the Ration and Supply parties.

This was a motorised telpherage system comprising a series of T shaped poles along whose arms would run two transporting wires which would send rations, supplies and ammunition to the Trenches.

At this time H.G. Wells was a committee member of the Trench Warfare Department and his telpherage idea was received with enthusiasm by Winston Churchill and the matter placed in the hands of Captain J.A. Leeming of the Royal Engineers and his team from the Outside Engineering Branch of the Trench Warfare Department of which he was Director.

Captain Leeming developed H.G's idea and tests with three prototype Aerial Ropeways, as they came to be named, were held at Clapham Common, Richmond Park, and Longmoor. The third experimental line was decided on. It was cross shaped, could be folded scissorwise for easy portage, moved laterally, lain flat to allow traffic to pass the line of traction, was undetectable from the air and $\frac{1}{2}$ a mile of the ropeways could be easily assembled by 1 Officer and twenty men within $1\frac{3}{4}$ hours.

The first mile of ropeway was despatched to the Front in December 1917 where it was erected by the Forward Transportation Dept across rough country and subjected to all kinds of tests which proved very satisfactory. The ropeway was then handed over to Canadian Railway Troops to feed a battery with ammunition at the Front areas.

56 miles of ropeways were then put in hand for the Front and a mile for Salonica was despatched.

They were operated by the Foreway (Tramway) Organisation, the Forward Transportation Dept, Canadian Railway Troops and Gas Services and by troops to bring back wounded from the Forward areas, for salving empties and reusable materials from trenches and dumps and for dug out work for removal of spoils.

The ropeways were used effectively for 11 months until the war ended on November 11th 1918.

War Diaries found at the Public Records Office referring to the ropeways state "...it is possible to supply as much ammunition to Forward Trenches during the hours of darkness with 15 men as against 1500–2000 men carrying the same, to say nothing of the saving of life."

The Ministry of Munitions file relating to the ropeways which H.G. Wells mention in his 'Experiments in Autobiography' was destroyed in the War Office fire during the 1944 blitz, but a copy of the file complete with 16 photographs and other material on the ropeways was found at the Public Records office, and 6 patents were located at the Patents Office by a member of the H.G. Wells Society last year.

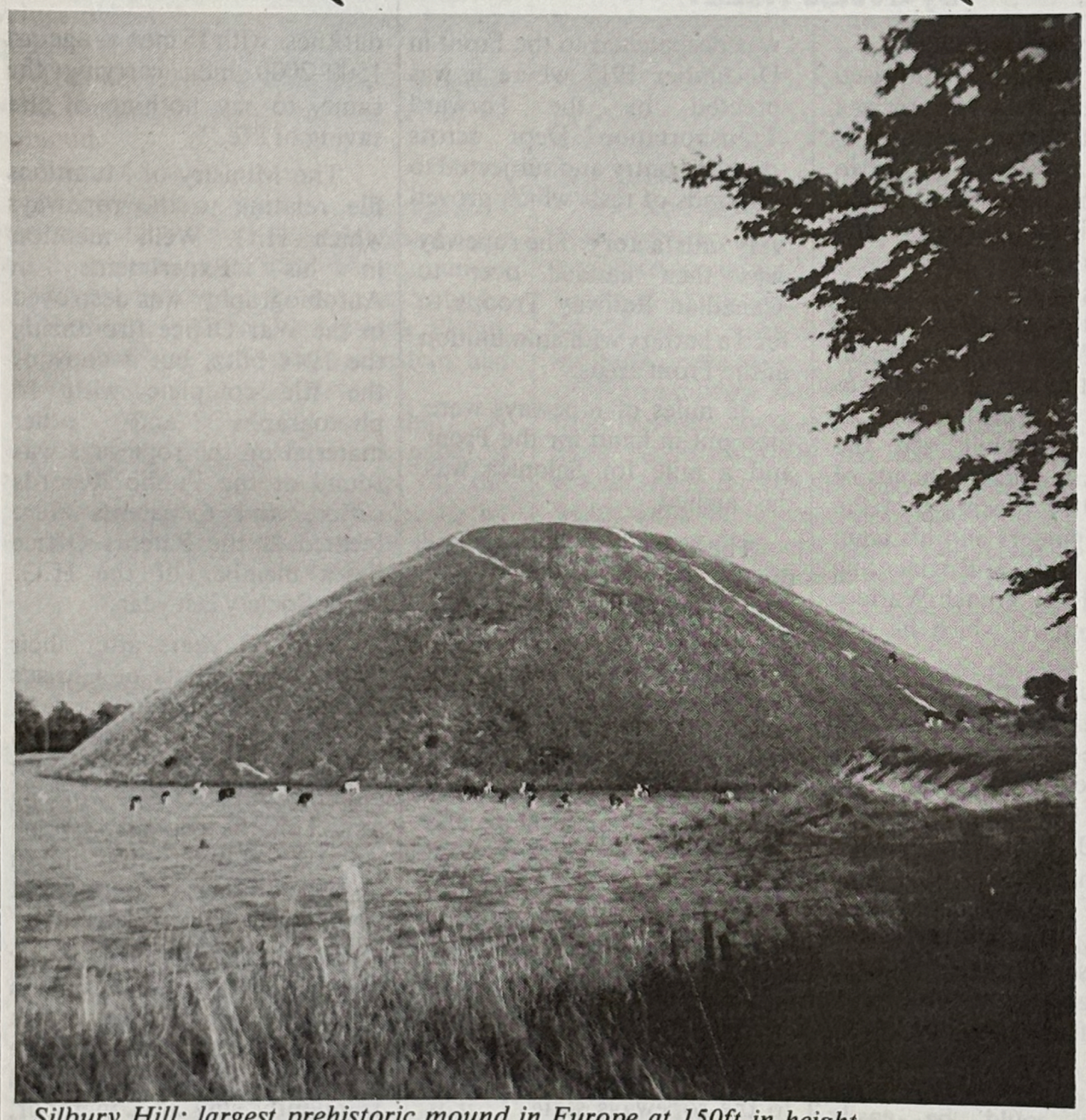
Now 62 years after their invention students of Christ's College technology class, Finchley, are working from copies of the file and patent papers to make a scale working model of the ropeways which will be exhibited in London before finding a permanent home in an army museum.

Gary Davies and Terry North, the students working on the ropeways, are both sergeants in Christ's College Combined Cadet Force and frequently stay at Longmoor, one of the experimental grounds of the ropeway, on army maneouvres.●



Making sure that the theory of H.G. Wells' ropeways still works.

The Spirit Of The Earth



Silbury Hill: largest prehistoric mound in Europe at 150ft in height.

The many real and supposed mysteries of the Earth have created cotinuous speculation. In this article, Paul Devereaux looks at a real and countrywide mystery of the leys and their meaning.

When Alfred Watkins discovered the existence of leys in 1921 he couldn't have guessed that he was about to set a chain of events into motion that would lead us not only to a fresh look at the remote past but also to a new vista of our future. A future that may tell us more about ourselves, our planet and cosmos, and about the strange forces that flow through all creation. But before we discuss the exciting material that is currently coming to light, what exactly was Watkin's discovery all about?

By 1921 Watkins was in his sixty–sixth year; he was a respected figure in the county of Herefordshire. A local businessman, magistrate, inventor and countryman, he was also nationally respected as a first–class, pioneering photographer. A man of broad interests with an open, exploratory mind who had spent many years getting to know his local landscape at a direct and intimate level.

So the appropriate mind and physical circumstances were all set up for the flash of insight that occurred on that summer's day in 1921. A visit to Blackwardine in Herefordshire led him to note on a map that certain ancient sites – prehistoric earthworks and ancient camps – fell into a straight line.

'I followed up the clue of sighting from hilltops,' Watkins wrote, 'and unhampered by other theories, found it yielding astounding results in all districts, the straight lines to my amazement passing over and over again through the same class of objects.'

Watkins undertook four years' intensive research and fieldwork in Herefordshire and the Welsh border area. His theory developed to the point where he could write his main book on the subject, The Old Straight Track, in 1925. Watkins called these ancient alignments 'leys (pronounced 'lays') for various etymological reasons that needn't bother us here. These leys had mark points that indicated their course, and these markers either were prehistoric – burial mounds, standing stones and stone circles, earthworks – or were of the historic period but had evolved on locations of former, pagan sanctity. Such historical ley markers include pre–Reformation churches (i.e. before about 1500), ancient crosses such as Saxon or medieval ones; very old crossroads or track junctions in open country; traditional fording points on rivers; circular moats; named,old trees (replacing earlier markstones), such as the 'Gospel Oaks around the country; Norman and earlier castles; holy wells and Stewart sketches of ancient roads or tracks that fall on leys marked by points such as any of these.

Leys are the remnants of prehistoric traders' routes, old straight tracks, Watkins maintained. While accepting their prehistoric origins (probably in the Neolithic period), modern ley hunters feel that the track explanation is too simplistic. No one doubts, however, that certain sections of these alignments may have evolved into ritual paths or secular trading tracks long after their purpose became obscured by time and events.

In our recently published book, The Ley Hunter's Companion, Ian Thomson and I give examples of English leys and go into the full details of Watkins' work and how leys can be traced on maps and followed on the ground. We found his list of ley markers to fall time and again on alignments, and we added a marker not mentioned by him – henges. These are large, circular earthen enclosures of very early date (usually early Bronze Age) that sometimes contain stone circles, but by no means always. Their purpose is unknown, but they are always a good indication of a ley's presence, in our experience.

As a result of Watkins' writings on his discovery, the Old Straight Track Club was formed and was active in the 1920's and 30's. (It is said that ley hunting became the fastest growing outdoor hobby in the 1930's.) But with the deaths of Watkins and other leading ley hunters and the onset of World War Two, the movement lost impetus. The club was disbanded in 1948.

Yet in 1939 a prophetic note was struck by a man called Arthur Lawton. In a booklet entitled Mysteries of Ancient Man he gave an account of his detailed researches into the layout of ancient sacred sites. Apart from alignments and recurring angles relating to the sites, he noted the occurrence of standard distances between certain types of location. These distances broke into multiples of very ancient measures such as cubits and reeds, Lawton discovered. His work led him to conclude that there was 'a common origin for the derivation of sites – possibly the existence of a cosmic force unclassified today but utilised in dowsing, and that the distribution of this

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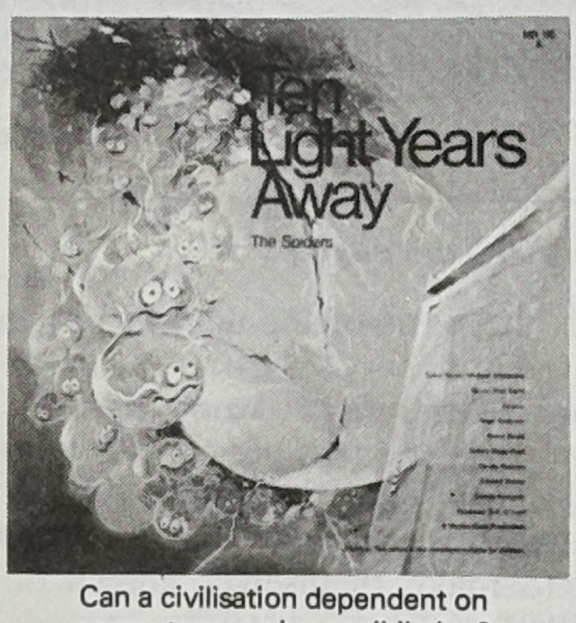
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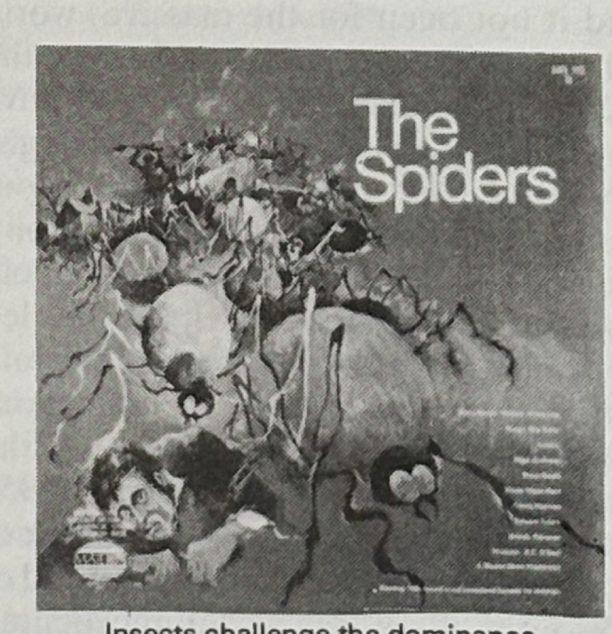
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Glastonbury Tor. Sacred hill in Somerset. On a few leys.

Continued from page 12

force is the basis of the ancient system of measurements'.

But this significant work came as the swan–song to the first period of interest in ancient mysteries. It was an unknowing pointer to the 'new wave' of ley hunters who began to make themselves known in the early 1960's.

Had it not been for the massive, world wide modern interest in UFOs, in fact, the ley theory and its implications might have sunk without trace. As it was, a ufologist and ex–RAF pilot called Tony Wedd put together leys and UFOs as an area of joint investigation in 1961. Wedd had read an old copy of The Old Straight Track and this led him to wonder if leys and orthotenies could be one and the same phenomenon. 'Orthotenies' was a term coined by the French researcher Aime Michel in 1954 when he was studying a massive outbreak of UFO sightings in France. During a period of a few months there was an unprecedented number of claimed sighings of UFOs, many of the 'close encounter' type. Michel gradually began to realise that, in any 24 hour period, sightings of landed or low–level UFOs occurred in striaght lines he called 'orthotenies'. Could these be the same thing as leys, Wedd asked? Could leys be lines of some form of magnetic earth current laced across the land, marked out by sensitive cultures in prehistory, and used now as then by UFOs as a source of energy or guidance? As it happened, there was an outbreak of UFO sightings in Wedd's part of Kent at the time and he was able to check his theory out. He satisfied himself that UFOs were reported over places falling on acceptable leys. The Kent 'flap' of the period was centred on the Keston area, where there is a huge hilltop earthwork that is prehistoric despite its name of 'Ceaser's Camp'. In a similar manner, the Wiltshire town of Warminster, renowned as the 'ufocal' of thousands of UFO reports by all manner of people in the 1960's, is surrounded by an exceptional number of prehistoric barrow–mounds and earthworks.

Whether what Wedd had stumbled on was fact or coincidence, the idea of linking UFOs with ancient sites and alignments proved to be a potent brew. Shortly afterwards a group of ufologists formed themselves into a new ley hunting group. The Ley Hunter magazine started to be published, and a fresh area of inquiry began to form itself.

But the whole thing might have petered out again (as the magazine did at the time) had it not been for other events taking place during the same decade. New, scholarly material was being published on astro–archaeology by people like Professor Gerald Hawkins, and more importantly, Professor Alexander Thom. The work of these people showed that prehistoric peoples had the grasp of an unexpectedly sophisticated use of astronomy and that their stone circles, long thought to be crude stone monuments, were laid out to an advanced standard of geometric precision. The reasons for all the exact surveying carried out in prehistory was now known, but some of it seemed to be associated with alignments for astronomical observations of great exactitude. In fact, the use of outlying stone and skyline features from megalithic sites seemed to indicate an astronomical awareness that went well beyond the calendrical needs of supposedly primitive agricultural communities.

This work meant that, despite the protests of orthodox archaeologists who preferred to believe in prehistory being peopled by savages from whom our 'superior' culture has steadily evolved, the real nature of prehistoric society had to be looked at again. This is a process going on at the present time from many angles.

During the same period in which this revolutionary work was being published, a new cultural mood was being generated by young people, culminating in the psychedelic climax of 1967. At the same time, an unprecedented number of UFO sightings was being reported in Britain and around the world — often by responsible, non—hallucinatory people such as policemen and airline pilots. Rumours of a 'new age' were afoot, as the dawning of the zodiacal 'Age of Aquarius' became imminent. And weren't there the signs in the heavens to prove the fact?

Into this stimulating situation came two timely and seminal books by the antiquarian and author John Michell – The Flying Saucer Vision (1967) and The View Over Atlantis (1969). These introduced theories associated with UFOs, leys, ancient sites, former civilisations on earth, strange legends such as dragonlore and so on to a wider and more eager audience than previously. With news of UFO sightings elbowing the more usual items from the headlines, this new approach to certain mysteries fell on fertile ground. In 1969, for example, the journalist Paul Screeton republished The Ley Hunter and it has gone on from strength to strength ever since.

In the same period a huge impetus to public interest in ancient matters was caused by the writings of Erich Von Daniken. Although he made some factual errors, he correctly perceived that there were ancient anomalies to be explained. But he made what in my view was the error of latching on to the 'ancient astronauts' theory (not originated by him, incidentally). This is a typically mid—twentieth century mechanistic concept invoked to explain mysteries that are far more subtle than Von Daniken seems to realise. Nevertheless, his work has helped greatly in creating a large–scale public awareness that there are mysteries lodged in aspects of the ancient world.

While the gaudy, excited mood of the Sixties has subsided, the seeds planted then have gone to earth, and the first shoots are coming to light a decade or so later.

These seedlings of new understanding are heralding themselves in a variety of ways. Exceptional mass interest in the occult, magic, alternative lifestyles, spiritual practices, paranormal phenomena – all are indicative of fundamental activity going on in the 'collective unconscious', or whatever you want to call it. Evolution doesn't only manifest itself in monkey's tails disappearing over aeons, or dinosaurs dying out: the mind is part of nature too and it has come to an active phase in its evolutionary development. At the present time there is a great deal of research going on that will gradually become more widely known as its implications begin to sink into conscious awareness. The 'Geller' effect, the 'power of pyramids', the inner secrets of plant life, and the rest of it, all represent the tips of icebergs of new knowledge that have happened to project themselves into public awareness. Behind the scenes work by relatively small numbers of researchers are settling the scene for revolutionary changes in our understanding at a cultural level. An example of this that we can currently see is the growth of ufology from the work of a

handful of dedicated people (or 'cranks' as their detractors called them) to the production of multi–million dollar films that make box–office history around the world. Whatever the experts say about UFOs (and who is more expert on the subject than these who have witnessed or spent years of research on such phenomena?) there is now a fully conscious and extremely large–scale public agreement that they do exist, whatever their final nature is shown to be.

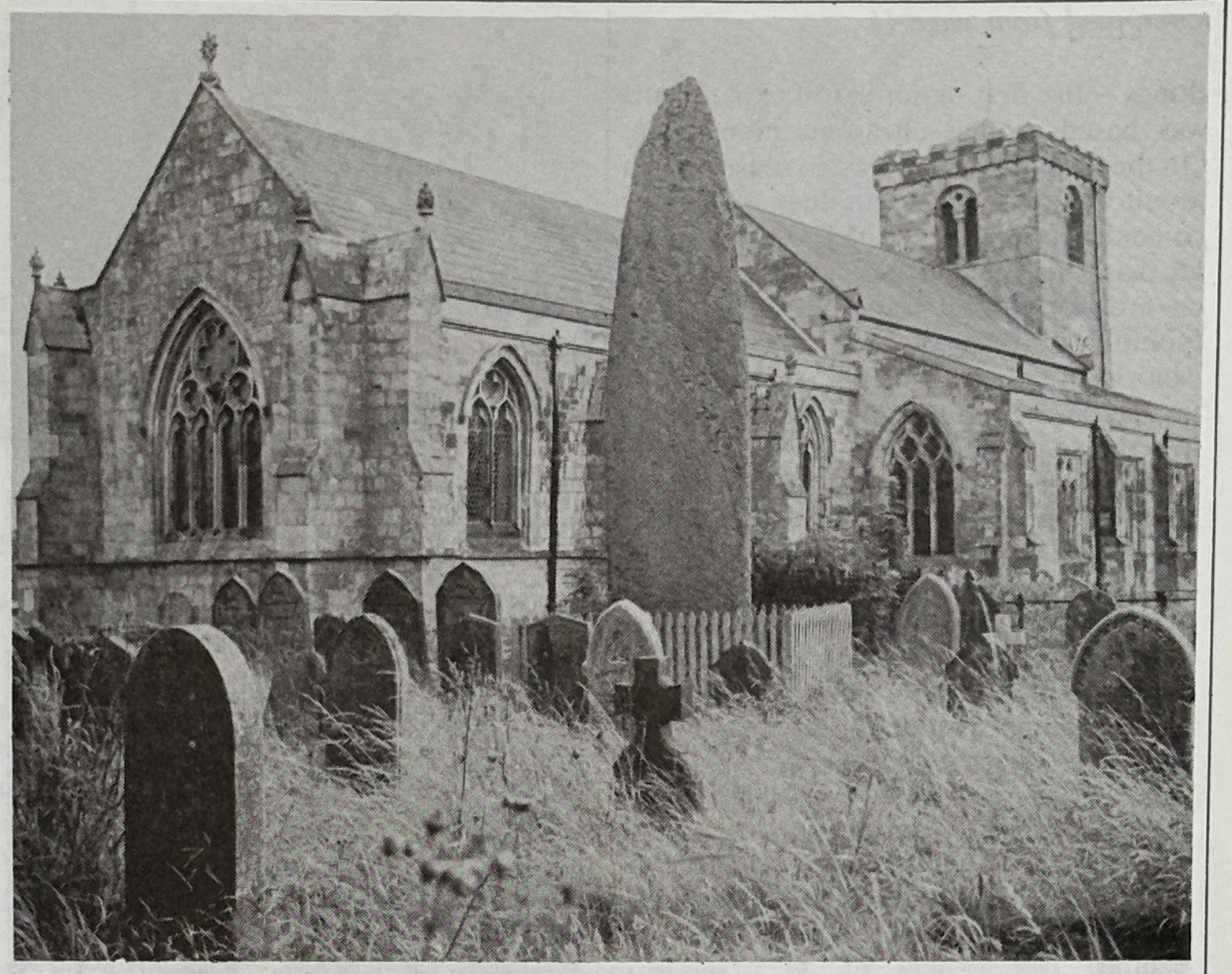
My own little area of involvement in the 'new thought' going on behind the scenes is concerned with the fruits of Alfred Watkins' discovery. Ley hunting is a bridge–building study: the area of investigation it has created around itself is becoming known by the suitably all–encompassing term of 'Earth Mysteries'

Earth Mysteries is an umbrella term for an area of interdisciplinary research and thought drawing on a wide variety of studies. We have already noted that ancient civilisations, ufology, astro–archaeology, archaeology and ancient lore are involved, but the net is wider than this and seems to be spreading all the time to include dowsing, physics, inorganic chemistry, electronics and so on.

When Paul Screeton handed over The Ley Hunter to myself and my colleagues in 1976, we felt two things had to be done: firstly, to update, clarify and improve the level of proof for the ley theory and, secondly, to fully investigate the claims of strange energies being utilised in prehistory. We like to feel that The Ley Hunter's Companion has gone some way towards the first objective,while the second one is just now getting off the ground in the form of 'The Dragon Project'. As this latter holds the most potential for our future, I'll conclude this article with a discussion of its parametres of operation.

Dowsing is an ability possessed to a greater or lesser extent by many people. Apart from the dowsing of water, the ability can be used for finding mineral deposits, lost items and even as has been proved on a number of occasions by really proficent dowsers helping the police uncover dead bodies or pieces of evidence. Dowsing can take place on location or can sometimes be performed at a distance by means of map–dowsing or photograph–dowsing.

As Earth Mysteries research began to develop, it became apparent that the dowers had a lot to tell us. Expert men like the late Guy Underwood had for many years dowsed subterranean water patterns beneath prehistoric sites (and certain cathedrals and old churches); particularly the presence of 'blind springs' beneath the surface of the ground. This complex system was called 'geodetic' by Underwood. Other dowsers, like Andrew Davidson, had picked up dowsing signals off prehistoric stones themselves: there seemed to be changes of polarity in this 'force' to a rhythm that semed to be associated with lunar phase. The extremely proficient Welsh dowser whose wide variety of dowsing work has been objectively confirmed on numerous occasions – has also been reporting an energy affect around standing stones for some years. He describes this a helical force that changes polarity each lunation. At



The Rudston at Rudston, Humberside. Largest monolith in U.K. at 25ft tall. On a ley running south from Willerby church.

certain points or 'nodes' on a standing stone a dowser can detect certain effects, he said. When Francis Hitching was researching for his book and TV film Earth Magic, Lewis persuaded him to bring in a physicist to confirm his dowsing findings. This was done. A physicist with a gaussmeter was able to detect anomalous magnetic effects around the stone. Lewis marked with chalk where the nodes occurred on the stone, and in a later experiment when the gaussmeter probe was passed down the megalith from top to ground the meter registered an effect at some of the marked points. Not conclusive evidence perhaps, but an extremely strong indication that something could be learnt from scientific study at megalithic sites.

In addition, Lewis maintains that there are horizontal emissions of some form of force radiating out above ground level from standing stones, travelling off across country in straight lines. It should be pointed out here that Lewis is no great supporter of the ley hypothesis. The young dowser, Tom Graves, coined the term 'overgrounds' for these emissions. His intensive dowsing survey of the Rollright circle near Oxfordshire showed these emissions to show 'Pulses' every so often, and that there were 'positive' and 'negative' signals within the circle and between the stones. Apart from cross—country overgrounds, Graves found that there were overground force—lines circuiting between the stones of the circle itself, as if 'a head of steam' was being built up before 'energy gates' in the circle released a straight overground emission into the distance. All these dowsers could tune in to the underground geodetic system as well. It began to look as if the stones were performing some sort of interface function between underground and overground earth currents, or perhaps that they were acting as transducers for the underground currents to be stepped up and emitted as a modified and controlled current above ground. There was clear evidence too, that cosmic influences could affect the strength and periodicity of the force.

There is a simply vast body of folklore that says stones at prehistoric sites can move, emit sounds, go down at midnight to nearby rivers to drink, are petrified dancers,can heal, can provide oracular divination, and so on. In other words, there is a folk–appreciation that some curious force resides within the stones, that they possess some strange power, some quickening or living quality. And that they can have an effect on human beings. What is the source of such a persistent, ancient and huge amount of folk–memory?

Some stones such as the Twizzle and Tingle stones in Gloucestershire may give clues in their names. Some dowsers (and others who thought they couldn't dowse) have reported a tingling sensation when touching stones on certain occasions.

It became clear to us at The Ley Hunter that the first thing that had to be done was to study a particular site in depth. But who was to carry the work out, and where? In the winter of 1977 I called a meeting of people who subscribed or contributed to the magazine and who possessed informed skills in branches of science, dowsing and electronics. It was agreed that some form of project was feasible. The owner of the Rollright Circle gave her permission for the use of her site for the project's base. The proect was named The Dragon Project by co–ordinator John Steele because Earth Mysteries researchers had long since come to realise that some aspects of the complex of dragon legends that exist use the dragon as a symbol for the serpentine earth forces that we were gathering to study.

Nearly a year went by as preliminary planning and organisation was undertaken. By a series of coincidences if there are such

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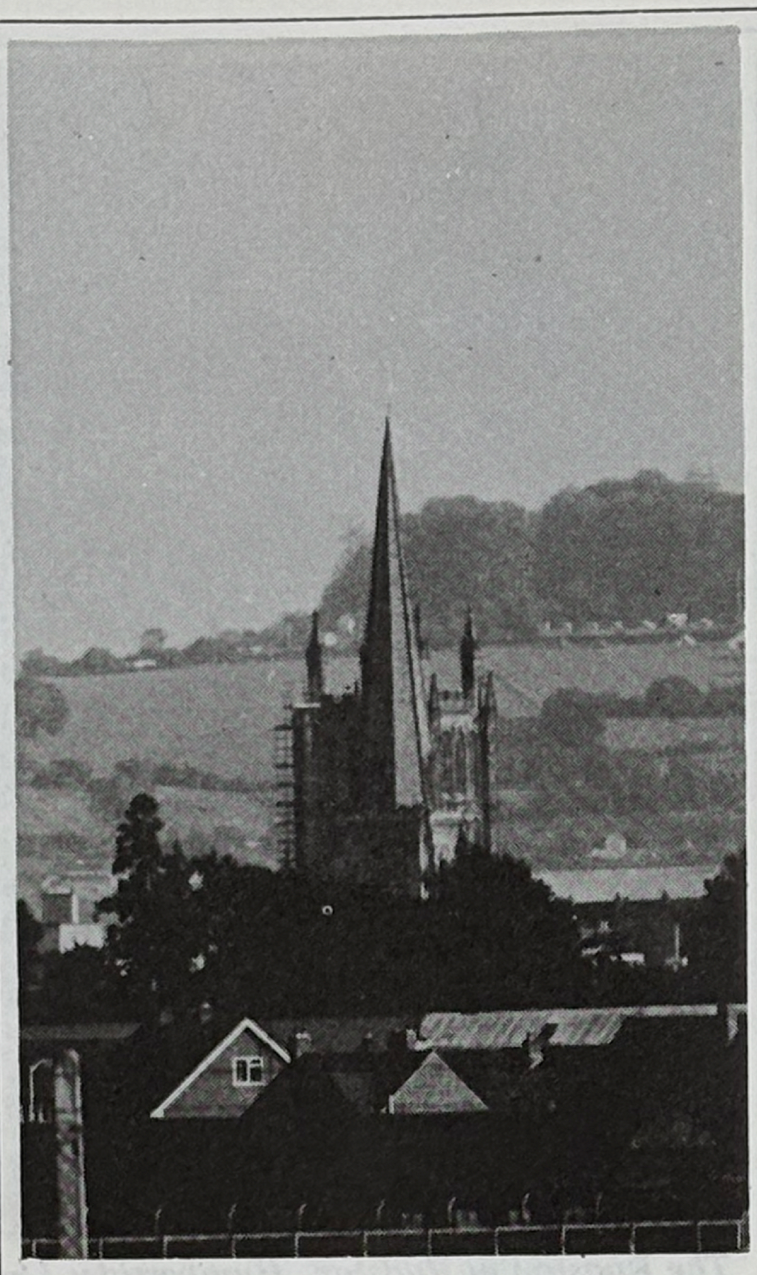
things – the first major set of experiments was based around ultrasonic monitoring. On the face of it, there was no sense in such monitoring, but another curious coincidence was taking place that changed all that. Another of the Dragons Project's co–ordinators, and leader of the physical monitoring aspects of the Project isinorganic chemist Dr. G.V. Robins who is involved with advanced pioneering research into the nature of stone.

Stone seems to most of us to be the most inactive, intractable substance imaginable; but the work of Robins and his university colleagues is showing that nothing could be further from the truth at the electron-level of the substance. Within the last year or so they have discovered undreamt of changes and interactions within the lattice structure of the stone that is opening up, quite literally, a completely new area for scientific inquiry. Ultimately, some of the implications of their work could lead us into a technology that will leave the microprocessor of "Silicon Valley" far behind.

What this very recent work is demonstrating is that the notion of curious energy interactions at megalithic sites is suddenly removed from the "lunatic fringe": it becomes an intriguing scientific possibility. The Dragon Project is most fortunate in having a man with feet in both the orthodox and fringe camps, and who can see linking lines of research informing them both. Apart from physical monitoring, specialised photography of the stones is taking place, and the EEG monitoring of the brain rhythms of dowsers, sensitives and psychics while they are present at the Rollright site. The instrumentation being used in this is the world's most advanced bi-lateral EEG device known as the "Mind Mirror", developed and used by Geoff Blundell (Audio Ltd) and Maxwell and Isabel Cade. A wide ranging geological study of megalithic sites is also under way.

At the time of this writing new people and new work within the overall scope of the project are being introduced to the investigation. To date, only the ultrasonic monitoring has a sufficient data-base for us to begin to detect clear effects. Enough is known at the moment to say that something odd *is* going on at Rollright (and another site in Cumbria). The effect is best monitored at dawn. The graphs are showing a strong link between lunar phase and duration of the pulses being recorded. Interactions between the elements of the megalithic complex at Rollright (a circle, outlying standing stone and dolmen) are also beginning to show up. The theory being developed by Robins to account for the effects being monitored is becoming increasingly satisfactory as time goes on; and its implications are staggering.

No weird, "new" energies are being postulated, but rather the occurrence of unexpected interchanges of known forces. It is possible that solar microwaves are entering the stones at dawn (before they are swallowed up by more encompassing effects as the sun rises in the sky).



Alignment of church and cathedral in Hereford with edge of prehistoric Dinedor

Microwaves occur just "beyond" the infra-red phase of the electromagnetic spectrum, and it is this area of activity that gives the sun at dawn and sunset its characteristic reddish hues. The theory predicts that this microwave energy is exciting electrons in the stone that resonate within defect cavities (recently discovered) within the lattice-structure of stone. By various complex activities which are beyond the brief of this article to describe, two things could be happening: pressure waves may be produced by transduction of microwave energy through the lattice structure of the stone, thus creating the ultrasonics we are monitoring; and enhanced microwave activity may be being "beamed" out in pulses from the megaliths because of the excitation of the electrons. If this is happening at a number of stones within a site, then a co-operative effect may be being created that could add up to a virtual MASER action (like a laser, but uses microwaves instead of visible light). If this is so, we have the basis of the dowsers' overground signals. We may also be touching on he original purpose behind the ley system.

It is early days as yet, of course, and these are only speculations, though informed ones. I should also add that I am a non-scientist interpreting as best I can the complexities of Dr. Robins's hypothesis, so any errors that may have crept in do not originate with the good doctor! But the upshot of the thinking now going on is there.

It is sobering to reflect that when Professor Thom was surveying hundreds of megalithic sites up and down the country, he kept coming across a standard measure of 2.72 feet which he callled "the megalithic yard". 2.72 feet falls within the wavelength range of the microwave section of the electromagnetic spectrum...

In addition, it is possible that the effect being postulated could be instrumental in creating a weak electric field around megaliths. This would account for the healing legends associated with many stones, for recent research at a number of universities is showing that *weak* electromagnetic fields can stimulate healing processes.

We have also captured a "glow" effect around the King Stone, the outlying megalith to the Rollright circle, at dawn with specialised photography. The nature of this "glow" is currently being investigated to see if it can be explained in mundane terms. If not, we have the photograph of the century on our files.

The EEG work, although currently at a very preliminary level, is showing interesting indications of certain brain rhythm effects on site.

It is all interesting, exciting material even though — I repeat — at a preliminary level of investigation. The Project is designed to run till the end of 1980, and I'm sure we'll have remarkable results to report by then. The Project is not funded by any body or institution; just by small donations and the time, goodwill and expertise of its participants. Need I say that if any **Ad Astra** readers feel they can donate finance of any sort, expertise or equipment I would be delighted to hear from them at **The Ley Hunter** (P O Box 152, London N.10)!

At all events I am becoming increasingly sure of one thing — our investigations into our remote yesterdays will have a profound effect on all our tomorrows.●

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DISCOVERY

THE NEWSLETTER OF THE ASTRONOMY AND PLANETARY SCIENCE NETWORK.

WATER AND LIFE BENEATH THE SURFACE OF MARS?

Life, as we know it, cannot exist without liquid water. Investigations conducted by the U.S. Viking soft landers, have shown that the surface of Mars is both extremely dry and devoid of organic material.

At the present day, the atmospheric pressure on Mars is so low that liquid water would be very rapidly converted into water vapour. There are features on Mars that appear to be dried up river channels or the result from melting of sub-surface ice, but none of these appear to be of recent origin.

Some researchers believe that most of these features are thousands of millions of years old, and formed at a time when atmospheric pressures were higher and the climate much warmer than at present.

The absence of water on the surface of the planet has been a powerful argument against the existence of Martian life.

At a recent gathering of planetary scientists at Providence, Rhode Island however, Dr. R. Hugvenin of Massachusetts University, claimed that spectroscopic evidence provided from the Viking orbiter probes circling Mars, and Earth based observatories has revealed high concentrates of water vapour in the atmosphyre above large areas of the Martian surface; suggesting the presence of extensive bodies of water.

The data required the existence of a lake some 640 km across in the area of Solis Lacus, and a lake over 1,100 km across in the area of Noachis and Hellespontus. Hugvenin- argued that since these bodies of water are not evident on the surface, they must be located underground, perhaps contained in caverns in a limestone like rock.

Mars may indeed boast life, but confined to subterranean environments.

QUASARS FOUND IN NEARBY GALAXIES

Quasars (or Quasi-stellar Objects) were discovered at the beginning of the 1960s when astronomers identified strong radio sources with star-like objects visible through ordinary telescopes. Since then, astronomers have discovered much more numerous radio quiet quasars.

Quasars exhibit large red shifts which have persuaded many cosmologists that they lie at greater distances than most of the visible galaxies.

If this is the case, they must be tremendously powerful energy sources, whose energy output is vastly greater than that of the ordinary galaxy. Yet short period fluctuations in output suggest that quasars are compact sources.

No phenomenon can propagate faster than the speed of light. Therefore, the discovery that some quasars can vary in brightness over periods of mere months, means that the bodies concerned must be no larger than light months in diameter.

Noone has suggested a convincing mechanism whereby such a small object could generate such prodigious quantities of energy. If quasars lie at great distancs, we must be seeing them as they were long ago. Quasars may no longer exist.

It has been suggested that radio quasars might evolve into the central nuclei of radio galaxies. Another school of cosmologists hold that quasars are local but much less powerful sources. Quasars red shifts may result from gravitational effects.

Some quasars exhibit several red shifts.

Now two American asronomers, Halton Arp and Jack Sudenbic and an Italian astronomer, Graziella di Tullio have provided cogent evidence that some quasars are associated with nearby galaxies. They have discovered eight quasars close to the triple galaxy system NGC 3379/33 84/3389. All eight objects are aligned roughly along the rotational axis of the elliptical galaxy NGC 3389. They suggest that the quasars have been ejected from the nucleus of the galaxy by explosive events. Each event creates a pair of quasars which are thrown out of the nucleus in opposite directions.

EUROPE TO PUT MEN IN SPACE?

The French Aerospatial company has tentatively suggested that the European Space Agency might launch a manned space programme within the foreseeable future. Plans under consideration include a 300 tonne rocket with a payload volume about half that of the U.S. Space Shuttle, and a mini-shuttle capable of carrying five astronauts into orbit.

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An Unsuspected Bright Cepheid?

The naked eye star, Rho Bootis may vary in brightness over the period of six days according to amateur astronomer Colin Pither of Charminster, Dorset. On May 19, he noticed that the star appeared somewhat brighter than normal.

Pither and a number of other amateur astronomers noted brightness changes on subsequent nights, using nearby stars for comparison. Pither estimated that Rho Bootis varies from magnitude 3.36 to 3.78. He suggests that the star could be a cepheid variable, a yellow super-giant star of mass five to ten times that of the Sun whose fluctuations in brightness are caused by a regular cycle of expansion and contraction.

Pither's claim was not unanimously accepted by other variable star observers, and remains to be demonstrated to the satisfaction of professional astronomers who will demand objective measurements.

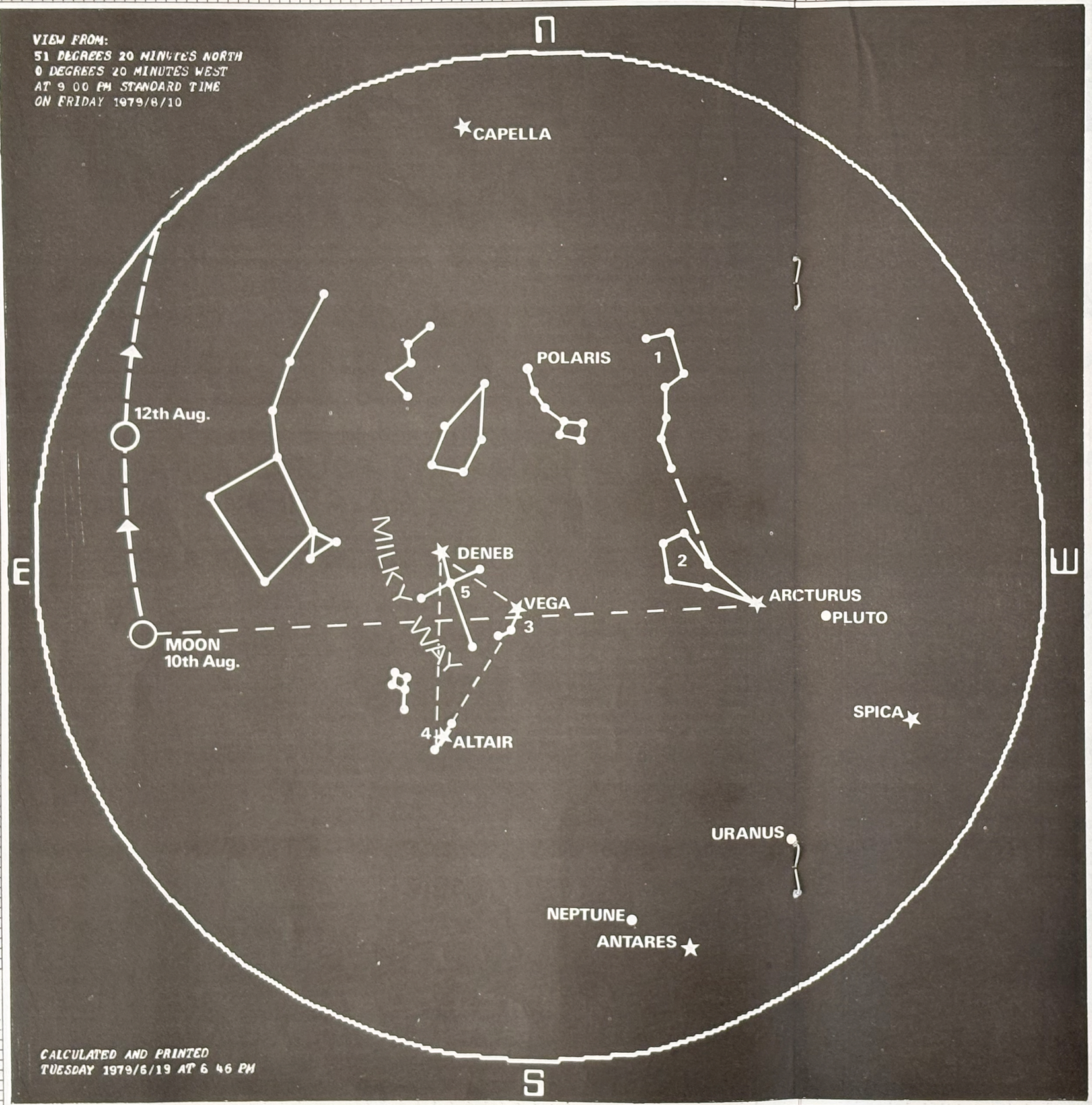
Robert Argyle of the Royal Greenwich Observatory, Herstmonceux plans to make photographic measurements of the star's alleged changes in luminosity using the observatory's 29 cm refractor.

If Pither is correct, Rho Bootis is one of the brightest cepheids as seen from Earth. It is on average, brighter than the type star Delta Cephei.

New Light On Earth's Magnetic History

Sediment cores from Loch Lomond, Scotland, have provided scientists with the most detailed information yet available of changes in the Earth's magnetic field during the last few thousand years. The magnetic record is preserved by magnetic minerals which represent less than 0.01% of the bulk of sediment particles.

The North magnetic pole has migrated generally westwards for the last 5,500 years with a short period of eastward migration between 1,100 and 600 years ago.



COMPUTOR STAR CHART

The Gentle Stars of Summer

by Dominic Murphy

Long summer evenings, preferably spent away from the town where the sky is just a luminous patch above one, are a good prelude to spending a little time contemplating the stars of the summer sky. For those with the inclination, for one reason or another, to get away from the dreaded street lamp, the sky in this season has some remarkable secrets.

In some ways we are fortunate this August, for the Moon will not be up till late, so our view will not be blinded by her brightness. However, for those using the Moon as a reference point, this situation also has its disadvantages.

About the 12th August at 11 p.m. you can see the Moon low in the east. She is just over 3/4 full and waining. Over the next three days she moves to the North and out of sight unless you are keen to lose more beauty-sleep to see her. She is on view again at a respectable hour at the end of August, waxing in the South West.

In the earlier part of the month we can use the Moon and Acturus in Böotes to find the three constellations we will consider this month: Lyra (the Harp — no. 3 on the chart), Aquila (the Eagle — no. 4) and Cygnus (the Swan — no. 5).

Using our old friend, the Great Bear (no 1), take an imaginary line extended from the last two stars in the tail of the Bear. Movement along this line about three times the distance between these two stars will bring you to the constellation of Böotes (no. 2). The most conspicuous star here is the first magnitude Arcturus.

Now draw an imaginary line between Arcturus and the Moon. Half way along it, you will find a big triangle of bright stars; Vega, the brightest star in Lyra, Altair, the brightest star in Aquila and Deneb, the brightest star in Cygnus. Lyra and Aquila are relatively compact constellations with two stars each (of any significance to the unaided eye) to accompany the first magnitude stars. Cygnus is more extended, forming a huge cross in the sky with the long foot of the cross pointing down to the south at the time shown on the map. These constellations are directly overhead in summer.

If you are lucky enough to be viewing on a clear dark night, you will also see a band of silvery light crossing the whole sky and passing through Cygnus and between Vega and Altair. This is the "Milky Way", the light from billions of stars which make up our galaxy.

It seems likely that the Ancients were in a gentle, even wistful mood, when they charted this part of the sky. The legends surrounding these constellations are not of violence and heroes, but of harmony and human love.

Our first constellation, Lyra, is the heavenly harp, drawn on old charts to represent the Sun, Moon, and five planets visible to the ancients. Pythagoras discovered (about 500 B.C.) that perfect tones in music were related systematically to the length of strings struck to produce the notes.

The relation of these distances became of great significance in the classical view of the organization of the Heavens. They believed that the seven visible "Wonderers" or planets plus Sun and Moon were distanced from the earth in such a way as to produce a musical harmony as they rotated.

It was thought that on a quite summer's night the star-gazer could catch this 'music of the spheres'. It is remarkable that the most modern physics has returned in part to this ancient concept of harmony. The universe, it would seem, is made entirely of waves, interacting in an insubstantial ether.

Human love creeps into the story as the harp was also said to belong to Orpheus, who so loved Eurydice that, after her death by snake-bite, he pursued her to the palace of the King of the Dead, Pluto. Orpheus's skill as a musician persuaded Pluto to resurrect Eurydice on condition that on his way out from his kingdom Orpheus did not look back to see her. Orpheus was impatient, took a peep, and all was lost. He ended up taking his harp to a party, in the sky, alone.

Aquila, the Eagle, represents a more robust and in this case successful approach to the gentle passion. Some believed that Aquila was the eagle that Jupiter appeared as, when he made off with a lady called Ganymede for purposes best known to himself.

Returning to the weepier aspect of the classical stage, according to Ovid, Cygnus was an ill-advised ancient who, attempting to drive the chariot of the sun across the sky fell to his death in a river. His sisters were so put out that they stood on the bank and wept till they turned to poplar trees.

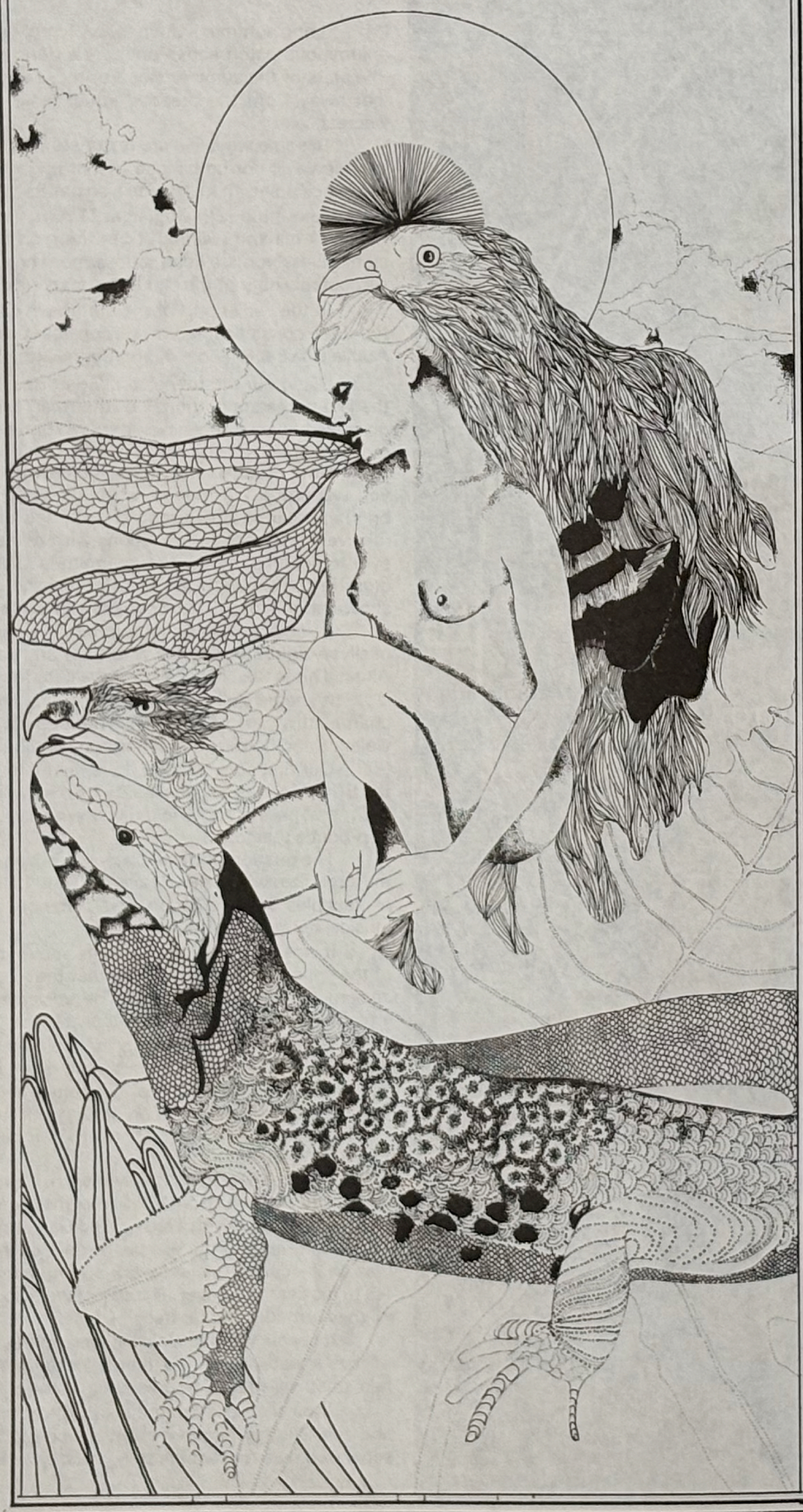
It seems that the Chinese were the authors of the most simple and poignant stories of love's lost causes. To them, Vega was Chih Nen, the Waving Lady, who loved a herdsman called Isshi (represented as the star we call Altair).

After their deaths, the spirit of Isshi was carried to heaven on the back of a crow, and the Waving Lady was similarly dispatched on a magpie. They became stars, but separated by a river which they could not cross to be together, except once a year on the

Continued on page 26

Mortification Of The Flesh

By Brian M. Stableford



He was Hunter by name, but more than half of his life passed before he came to realise that he was also Hunter by vocation. Like every Original man he was ill–fitted for the world in which fate placed him, and he spent several years searching the Higher Earths for a milieu better designed to contain him. He found none, but was slow to let the thread of destiny draw him back to his birthworld and away again in the other direction – into the realms of the Lower Parallels. Ultimately, though, it had to happen.

The Lower Earths take a greater toll of a man than the Higher. Because of the energy differential, access is easy but return expensive. The differential is also expressed in the life and the landscape –relative to the Original the Lower Earths are decayed, their suns malicious. Human life is shorter, harder, more painful. Whereas the inhabitants of the Higher worlds are ethereal and angelic the indigenes of the Lower are brutal and bestial. Perhaps it is only vanity which makes us feel that we are closer kin to the natives of the Higher Earths, but there are many reasons, mental and physical, for the apparent remoteness of the races of the Lower worlds.

Because he was the man of his name it was in the Lower Parallels that Hunter belonged. He had to go not only to them, but also through them, for a real hunter progresses by stages through all the appropriate species of prey. A taste for killing is something which envolves and matures, never settling into any constancy. As every challenge becomes a trophy, new challenges arise. There is no satisfaction in repetition, which transforms the art of murder into the vulgarity of slaughter. Hunter was, of course, an artist, not a warrior. In the twenty–ninth century there is no such thing as war. Hunter killed not for honour or profit or glory or amusement, but for love.

Hunting is a vocation without a consummation. The hunter goes on, until he is hunted to his own death. That is universal symmetry, defined by the principles of analogical aesthetics. (It is the same, of course, with all other forms of sexual sublimation.) All hunters come to the final hunt, in which they face the prey–the metaphorical representation of their own mirror image. In Hunter's case, the prey was Moloch horridus – not the ugly but inoffensive Australian lizard so designated in the Original, but its doppelganger in the lowest of all the twelve Earths, the crystalled moloch of the Abyss.

Hunter's weapon was the needle of light, the gentle gun – the death ray. No other weapon requires such delicacy of touch, such precision of aim. No other weapon kills with such instant grace. With the death ray, Hunter killed the horned and the hooded, the armoured and the clawed, the venomous and the fugitive. He hunted in the aerial winds or under water, in caverns or in swamps, in forests and eternal mists. He passed through Morphea, the sub–world; Catalepta, the Pit; and through the many lands of Thanatar, the Abyss.

Thanatar has seventeen continents, some prisoned by ice, some sweating with stagnation. There are many kinds of

wilderness and Thanatar has avatars of them all. All welcomed Hunter, marrying him to their own slow processes of death and desolation. They made a spiritual home for him, supplying his soul with warmth and making mistresses to serve his flesh.

Hunter killed, and killed, and killed. His hair was bleached, his skin burned to the colour of peat and the texture of horn. The irises of his eyes turned black and a spinal cancer grew like an aching fire beneath the base of his skull, extending fringes of pain like contour lines across the borders of his tissues and his bones. The flame made him mad, but the madness only tortured him, in no hurry to make him die. The cancer was the antithesis of his identity– no hunter but a black carrion creature content to possess him when death had come and gone in its own sly fashion.

Thus did Hunter come to the equatorial island continent of Tartaros, to hunt the giant jewelled lizard.

The natives of Tartaros believe that time runs backwards throughout the universe, that death is birth and birth is death. They believe that human perception of time's flow was reversed by the unknown gods as a punishment for a long—forgotten sin committed by an unknown ancestor of all humanity in the Highest Earth. They perceive their souls being dragged back against the streams of universal consciousness, helplessly drawn further and further away from the true cosmic destiny. For all the other human races the Tartareans see no hope, but for themselves they prescribe a special miraculous salvation – a reward for having survived the harshest trials of all, to be symbolised by the payment of some enigmatic price at the alter of the unknown gods at some indeterminate time. Each Tartarean has faith that his or her soul will ultimately be redeemed, coming to know the universe and time as they really are, with order slowly emerging from chaos as entropy and the processes of putrefaction can be known as the builders and healers which they really are.

The natives of Tartaros are the kindest and gentlest people in all the twelve Earths, because they pity all the other human races, who are debased and perverted, irredeemably damned by the nature of cosmic law.

And, in fact, the natives of Tartaros are unique among the human races. They copulate with their mouths, the tongue being the erectile organ of intromission in the male, while in the female the homologous structure is long and ribbonlike, used to caress its male partner. In the female, the womb is situated in the torso, protected by the ribs. The intestinal tract (which has a distensible gullet in the throat but no stomach and no caecum) winds around the womb, interwoven with a reta mirabile of blood vessels. The lungs are multitubular, each tubule being equipped with its own piston muscle. The lower jaw is hinged like the jaw of a constrictor snake, so that the mouth may gape widely enough to disgorge an infant. The faces of the Tartareans (male as well as female) are, in consequence, rather froglike, but outwardly there is little else to distinguish them from some of the other human races — except, of course, for the single cloacal aperture between the legs. They are pygmies, males and females alike averaging one metre twenty—five in height. The females are generally more stoutly built.

Hunter crossed the sullen strait separating Tartaros from its neighbour continent in a flat–bottomed barge. He was given as a guide a native girl named Fantasma. Her body, accustomed to the fearsome sun though she and all her people spent the greater part of their time in the forest shade, was browner than his, and she went naked in the daytime.

There was no wind in the forest, the air held still by trees which stood forty metres tall yet still seemed twisted and stunted because of the thickness of their warty trunks. In the wood of every tree countless parasite–plants were rooted, their leprous blossoms forming garlands and leis to decorate every trail and hidden coppice.

Bright birds of many colours and dragon–flies with iridescent wings haunted the forest, but they made hardly any sound as they fluttered and flew, neither singing nor humming to disturb the hush of the crowned corridors. There was so little sign of life save for mere appearances (and sight is the most deceptive of senses) that Hunter quickly came to cherish the sensation of his own beating heart and the movement of his limbs. But he went silently in the forest, accepting its dictates. Fantasma, also was as silent as the unearthly – by habit, by breeding, by nature. Her people, the forest savages, were insect–eaters who preferred the crowns of the trees to the forest floor, and rarely descended except to urinate or to defecate or to guide hunters.

● ● ●

In the beginning, Hunter wondered whether he ought to keep Fantasma on a leash, in order to restrain such primitive impulses as might lead her to desert him in favour of the freedom of the treetops, but he soon discovered that there was no need. Fantasma was loyal, accepting her role with a complete commitment. She regarded herself as a gift from her people and the unknown gods to the light–bringer, the lord of rays, the ethereal alien who had accepted the harshness and the horror of Abyssal existence to bring a perfect death to the gem–scaled moloch. The only thing that she required from him in return was a pair of clogs, carved from the soft wood of a tree. Her tiny feet needed protection from the venom of the needle like grasses which grew abundantly on the forest floor, nourished by the nightsoil of her species. By day she gathered food for him, and prepared it to his taste. By night she would prepare him a bower of harmless leaves, and would perform upon him the subtle fellatio for which she was naturally equipped. Sometimes, instead, he would forsake the caress of her tongue and drive his rigid flesh into her hind orifice, which perversion she tolerated, but he would never kiss her, preferring not to reveal what might seem to her an ignominious impotence.

Their progress through the forest was slow. The evil vegetation often hampered them, and because the forest was a place of many poisons the way was always cursed with a penitude of danger. Several times they had to stop, while Hunter would fight for an hour or a day with fevered brain, blinded eyes or sickened heart. The cancer, malign but not mortal, played with him like a cat with a mouse, and the forest joined in the game.

Through all the crises of his illness Fantasma nursed him, sometimes soothing wounds in his skin with healing juices, other times swabbing pus and poison from carbuncles with cotton–like fungus. And in his healthy days she attended him with equal devotion.

She told him all that her people knew about the crystal lizard that was his prey. She explained that the crystalline scales of its armour, substained by some inner process intimately involved with the life–process of the organism, would almost always shatter or disintegrate after the death of the creature. Invariably, if the moloch died from poison, or of age, or by any common act of violence, its coat would revert to white powder. The only way to secure the skin whole, with its crystal ornamentation inviolate, was to strike the beast dead with a single convulsive shock that could somehow freeze the process of decay. Implicitly, the bolt of death had to strike in one of the two places that were not accorded the protection of the precious scales – the eye or the anus. The natives, having no practical access to the soul of the moloch via the eye, sometimes attempted to trap a moloch, immobilise it with supple ropes of vine, and then kill it by thrusting a red hot spear into its gut from the rear end. Almost invariably, the tactic failed, but once in a generation a whole moloch pelt would be secured in this way.

Hunter, armed with the needle of light, naturally intended to take the nobler alternative, to shoot through the eye and cauterize the brain. Fantasma had never seen such a thing attempted before, and nor had any living member of her race, though in the stream of time it had undoubtedly been done and would be again.

Naturally enough, the Tartareans knew legends concerning moloch–killers who used the eye, but such tales invariably became confused with stories of the unknown gods. Perhaps, in time, Hunter would figure in the legends.

Or perhaps he already did.

One day, Hunter used the laser rifle to kill a sequined mamba which threatened him from an overhanging branch. It was the first time that Fantasma had seen the weapon used, and she was fascinated by the ray of red light and the way it burned out the skull of the snake. She wanted to touch the weapon, but Hunter would not permit it.

The gun, he explained to her, was the symbol of his manhood, made holy by the attribution to it of qualities associated with the male element of the wellspring of life. The ability to enforce upon elements of the environment and artifacts created out of raw materials the qualities which man saw in his own being was, he told her, the true measure of man's triumph over bestiality. Man, he said, had extended himself into his world, converting it into a system of signs by

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THE COMICS REVOLUTION

TERRY EDGE DEALS OUT ACCOLADES AND BRICKBATS ON THE CURRENT COMICS CROP

Yragael and Urm by Druillet. *Published by Dragon's Dream*
Green Dog Trumpet and Other Stories by Ian Miller. *Published by Dragon's Dream*
2000 A.D. and Starlord *Published by I.P.C. Magazines Ltd.*

Children, by and large, get a bigger kick out of pictures than they do out of words. Most kids have to be browbeaten into some kind of adult mentality before they will peruse a book with as much relish as they will a comic, or, even better a film or, best of all, a live–action pantomime or circus. And not only that, the pictures must tell a straightforward tale; heroes must have glinting teeth and wavy hair, villains swirling black cloaks and hissing voices– action must ultimately speak louder than words and light must ultimately conquer dark, with plenty of seemingly hopeless black patches inbetween. Children aren't interested much in soul–searching or social dilemmas or group therapy. All they want is someone who is simply BAD to try to rub out someone who is simply GOOD and nearly do it, but with the good one winning and getting the girl in the end, although it doesn't really matter very much what he does with her after that.

Work At Being A Kid

In our adult wisdom, we have decided that books are better than pictures because they make you think for yourself more. We adults feel that a film or comic spells it out all too easily and that our children will become mentally deficient if they don't bash through the standard truckload of classics before their sixteenth birthday. As usual, however, we adults have missed the point. Of course, it's better that WE read books rather than watch films, but only because we're so much a slave to the personality of the director rather than the story he's telling. At least, in a book we have to make some effort to set the scenes ourselves, from our own imaginations; nevertheless, we're still very much subject to the author's style. What we forget is that children don't give two hoots WHO, all they care about is WHAT. You don't get the kids at the Saturday morning flicks taking notes and politely asking their neighbour how the director's first name was spelt. Kids are either hooked by what's happening or they're not. And, what's more, they're only hooked by certain, age–old, tried–trusted criteria for story–telling; they don't get a boot out of the same intellectual titillations that we do. An adult can go and watch a film just because he heard that Marilyn Monroe was an extra in a crowd scene that lasted four seconds. Kids don't even care if anyone's a good actor, just as long as the necessary minimum gets said for the action to continue as soon as possible.

Britain and America

Children aren't intellectual critics; they don't understand what 'camp' or 'ham' acting is; they don't watch in silence and they don't analyse after the event.

British comics have always been steadfast in their general belief in stating the obvious. Comics like the Beano and the Dandy are almost totally black and white, hard or soft, happy or sad, full or empty.

Kids don't go much on style and technique – as long as the symbol is correctly drawn, it will function. WE may lament the passing of the original Dennis the Menace artist, but show me the kid who gives a sausage over it.

British comics and cartoon films invariably have one thing in common, slapstick. Saying what goes without saying, if you like. You know: custard pies are meant for throwing and banana skins are meant for not noticing until it's too late. But the problem is – what we don't realise most of the time – is that kids believe it all, they realy do. You see, we pack the cinemas to laugh at the absurdity of old corny Flash Gordon movies, whereas kids can watch them totally enthralled and spellbound. So who's gained and who's lost what, exactly? Before he can enjoy a film, an adult will often ask his friend 'is it serious or a send–up', and once you begin to produce comics, slapstick, swashbucklers and cartoons for adults, the problem becomes paramount.

The American comics scene today is constipated with this kind of digestive dilemma. Marvel, for example, has spent the last twenty years trying to make its universe consummable to the serious adult mind. Marvel characters have problems, hang–ups; they swear, sweat, make (discreet) love, between punches, they mull over the deprived backgrounds of super—villains; they lose girlfriends, have 'cosmic conciousness', pay taxes. Most of them are even uncertain as to why they continually find themselves leaping out of normally closed windows in stretch–nylon tights, exchanging sparkling repartee with super—deviants at 200 feet and saving the world.

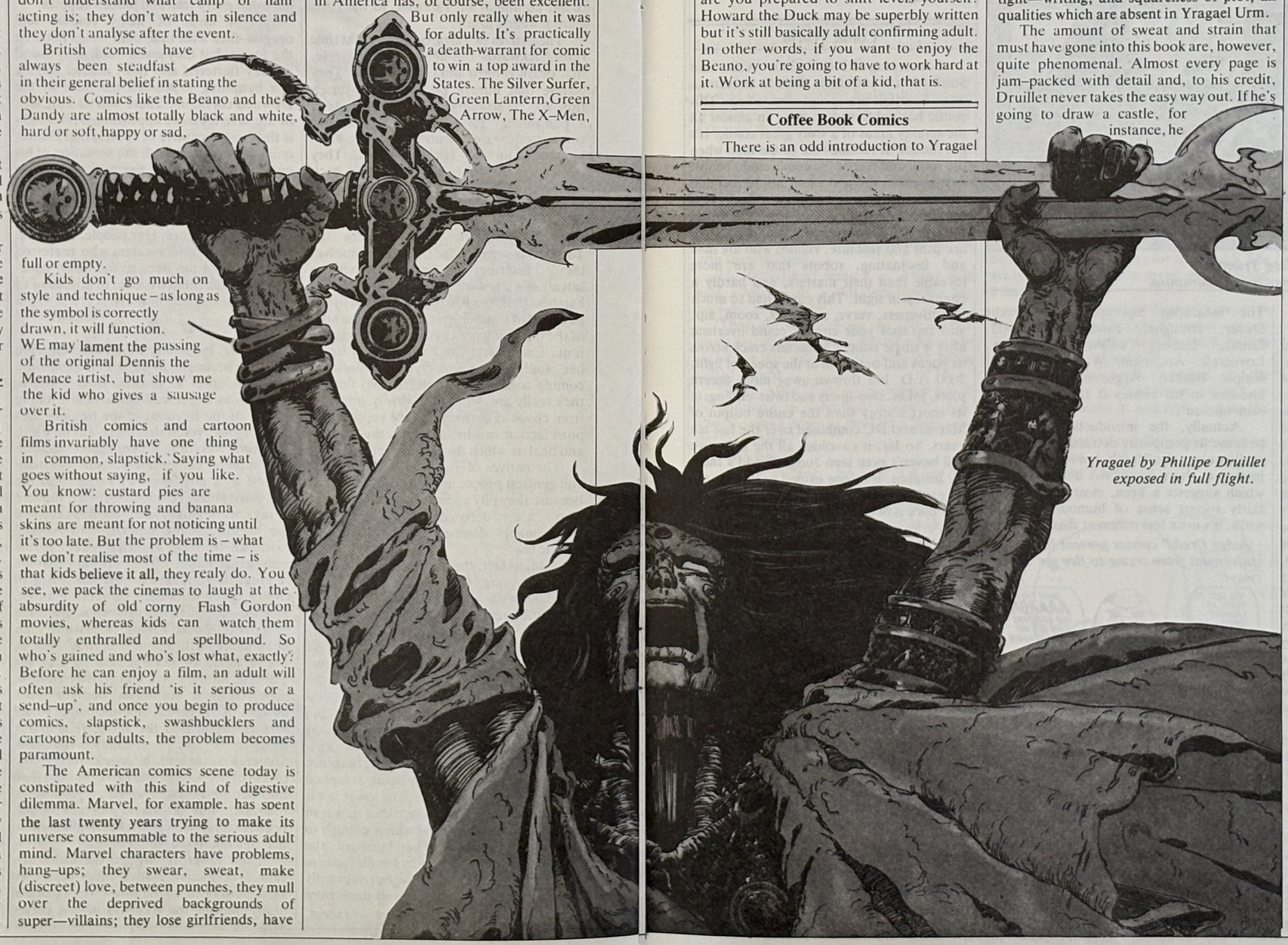
Some of the comics art and story–telling in America has, of course, been excellent. But only really when it was for adults. It's practically a death-warrant for comic to win a top award in the States. The Silver Surfer, Green Lantern, Green Arrow, The X–Men, Man–Thing, The New Gods were all great publications – the fans loved them; even students and people who don't like comics liked them; But they still got the chop. The kids didn't buy them – they stuck with Superman and Spidey.

The main question is, really, do you want a comic to gear itself to your level, or are you prepared to shift levels yourself? Howard the Duck may be superbly written but it's still basically adult confirming adult. In other words, if you want to enjoy the Beano, you're going to have to work hard at it. Work at being a bit of a kid, that is.

Coffee Book Comics

There is an odd introduction to Yragael Urm; it's written by Rene Goscinny, the co–author of 'Asterix'. In it he says'...a new master has appeared...' and '...Druillet has exploded the comic strip, taking it out of the narrow confines of small boxes. The echoes of this explosion are still spreading.' It's odd because the Asterix books are noted for their solidarity, uniformity, tight—writing, and squareness of plot, all qualities which are absent in Yragael Urm.

The amount of sweat and strain that must have gone into this book are, however, quite phenomenal. Almost every page is jam–packed with detail and, to his credit, Druillet never takes the easy way out. If he's going to draw a castle, for instance, he doesn't show a close–up of a brick with 'castle' written on it, instead, you get a great, sweeping panaroma of brick canyons and gulleys. Or if he's going to draw a fleet of ships, you don't get a sail and a line of masts disappearing into the distance behind it, you get an aeriel view of the entire harbour, containing literally hundreds of ships. The best picture in the book, in fact, is a row of ships, prows in the harbour; it's quite breathtaking exuding a solidity and depth which I only wish the rest of the book carried.



Yragael by Phillipe Druillet exposed in full flight.

Single pages of this book must have taken days to produce, and if you appreciate hard work and what must be sheer dedication, then you can only marvel at Phillipe Druillet's achievement. If, however, you are a lover of balance, grace, subtlety, poignancy, pathos and humour then you will, unfortunately, find his work something of a hollow effort.

You see, the whole secret of why comics can be so great, lies in the amazing amount of restrictions placed upon them. Restrictions like money, space, morality, time, what sells and what doesn't, what the Editor tells you you can and can't do. Everything works best by resistence and that's why all the best comics have been squeezed out by having the greatest pressures against them. Stan Lee's Spiderman, for instance, or Denny O'Niell's Green Lanterns that first dealt with drugs, or the Eagle...You would think that Rene Goscinny would know that.

There are few, if any, restrictions placed on Yragael Urm, other than the obligatory ones like size of paper and the colour spectrum, and to many people that will be its greatest strength. The opening page of Yragael shows a grotesque brown winged something ripping out the chest of a grotesque turquoise something, accompanied by the words 'IMAGINE THE OCEANOSPHERE THE VISCOUS UNIVERSE THE VORACIOUS SPINNING EYE OF MATTER IN THE BLACK AND SLIPPERY BLOOD OF THE SERPENT A FLASH OF FROST IN AN INKY SPHERE LIMPID SPIRAL OF THE SURGING LYMPH'. The story ends with the words: 'A TIME WILL COME WHEN YOU WILL HAVE TO LOVE YOURSELF WITH LIVING FLESH AND, AS I DO, TRIM YOUR OWN ORIFICES'. In between are fifty–eight beautifully printed pages full of swirling deformities, living castles, gigantic caverns, flaming firmaments, unsmiling faces, noble rhetoric, with browns, greens and reds predominating through out. It's a book of a visions, certainly, but the kinds of visions

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Ian Miller, artist and creator of 'Green Dog Trumpet' demonstrates his skill for strange yet humourous illustrations.

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that make you seriously wonder at the sources of Phillipe Druillet's imagination. The major effect is a strange glorification of ugliness and degeneration. Beauty is rare, humour totally absent. The technique is stunning but rendered redundant by the lack of a structure for it to form around.It's all flesh and no bones, basically. Pain, death and tortured forms proliferate, meaningless symbols abound...in a way, I suppose Druillet's book is merely a testimony to the incredible depths to which this culture can sink. A lot of people will, in fact, love this book. I've honestly tried my best to like it, if only for the admirable patience that must have gone in to its production. I've lived with it for three months, tried to appreciate it in every way I know how. But, despite the impressive appearence, I can't honestly say that it moved me in any way, other than in the dubious area of intellectual admiration.

Green Dog Trumpet and Other Stories is a similar package to Yragael Urm, big glossy and well printed. It also
has an introduction; this one tells us that
'Ian Miller's comic strip fantasies are microcosms of nervous unease.' It also manages to compare the book with Franz Kafka, Kurt Vonnegut, ('perhaps')the Book of Revelations, Arthur Rackham and Heath Robinson. The biography squeezes in Albrecht Durer, Breughal, Ensor, Grunewald, Grosz, Beake, Tolkien, Bradbury, Lovecraft, Anderson, Wells, Dick, and Ralph Bashki. Apparently, 'all that endures in his stories is the innocent of non–human'.

Actually, the introduction is a pity because its pomposity detracts from what is really quite a droll book. Ian Miller's skill is immense; there is a clarity about his work which suggests a keen, clear mind and a fairly robust sense of humour. In many ways, it's even less coherent than Druillet -

'Judge Dredd' cannot prevent his informant from trying to flee the wrong way!



there's no text for one thing – but at least it retains a certain honesty in its nonsense. It has a particular sense of respect about it, somehow; it doesn't beg for credence like the sombre Yragael Urm. There is a nicely balanced sense of the ridiculous mixed in with a touch or two of sheer English self—effacement and outright eccentricity that allows the book to take on a quirkiness that doesn't require explaining.

The drawing is clear and well balanced and refreshingly unclaustrophobic. In fact, it's a very luxurious book; so much so that some 29cm x 21cm pages display a single 10cm x 7cm picture or less.

The introduction made a mistake, however, in calling this book a comic. It isn't. The word 'comic' here is just an excuse to publish a series of pictures in a format that would probably be unsellable in any other field.

Comic World

Concerning I.P.C.'s 2000 A.D. and Starlord, it is extremely difficult to restrain one's heartfelt praise and admiration . This comic has continued to grow in almost all the quality areas of a truly great comic. It's got the lot. It reminds me of the time when the smell and feel of the comic could be just as magical as the text itself, not to mention that giggly sort of glee when you finally turn over the pages of another world. A world full of larger than life characters; heroes that are firm and resolute, villains who are mad and fascinating, robots that are more loveable than their masters, and hardly a hang—up in sight. This comic had so much inventiveness, verve, pop, fizz, zoom, zip, and zap that your circuits could overheat after a single issue. Characters crack across its pages and out again at the speed of light, 2000 A.D. has thrown away more decent plots, jokes, one–liners and twist–endings in its short history than the entire output of Marvel and DC combined over the last ten years. So far, it's avoided all the traps: we still haven't even seen Judge Dredd's face, for instance, let alone gained an insight into his past love–life, if he ever had such a thing. The pace is hectic.

Perhaps, on average, five out of every fifty Marvel or DC comics are worth reading these days, and that's if you've the patience and the money to wade through them all. Few of their better writers and artists survive the punishing and largely patronising demands of an almost paranoically conservative attitude to what is successful and what isn't. There are still people like Gene Colon to enjoy – an artist with real flair. A few flicks of the wrist and he can portray any of the really difficult human facial expressions such as wryness, complicity, gentleness...if you look through the pages of Yragael Urm you will notice a range of expression in its character that extends through something like quiet horror to screaming horror.

However, whereas Marvel and DC seem to discover people like Gene Colon purely through the law of averages, 2000 A.D. apears to actually seek them out and encourage them.

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WATCHING BRIEF

By Granville Wilson

It was not long after the world's oil wells began to run dry that my new neighbour first made himself known to me.

I was pruning my rose bushes when he looked over the privet hedge dividing our suburban homes and said, 'Good evening. I'm your new neighbour.'

His eyes, I noticed, were bright blue and unwinking under sparse sandy eyebrows. He was almost completely bald and his head looked too large for his frail–seeming body. He wore a black and white check jacket over a polo–neck sweater and black slacks.

We shook hands and the firmness of his grip surprised me.

He introduced himself as Alfred Bell and added with a diffident smile, 'My friends call me Alfie.'

That did not surprise me. He looked more like an Alfie than someone who would stand on his dignity and insist on being called Alfred.

'Well, Alfie,' I said, determined not to be outdone in suburban courtesy, 'how about coming down to the Three Stars with me for a drink?'

He beamed.

'Just a minute, he said 'I'll get my torch.

I nodded. It would be dark soon and, in order to save energy, the government had banned the lighting of street lamps.

The government had also closed down the moving pavements for pedestrians, and so we had to walk the mile to the pub.

The Three Stars was filling up when we arived, and after his third whisky Alfie began to confide in me. He was in partnership in the real estate business, and he had never married. Perhaps, he suggested, that was because he had moved about too often to put down roots.

'I thought you weren't from these parts,' I said.

'Really?'

'You haven't got the local accent,' I explained.

His face flushed and he said. 'You're very observant. The fact is that I don't stay in one place long enough to pick up local accents.'

'No offence,' I said hastily. 'Your English is better than mine. It's just that your speech is well, mid–Atlantic. More precise, more cultured.'

The bright blue eyes lit up at that and he murmured, 'You're very kind.'

I was hoping he would tell me where he came from, but all he said was, 'How about the other half, George?'

'Why not? There's still twenty minutes to go to closing time.'

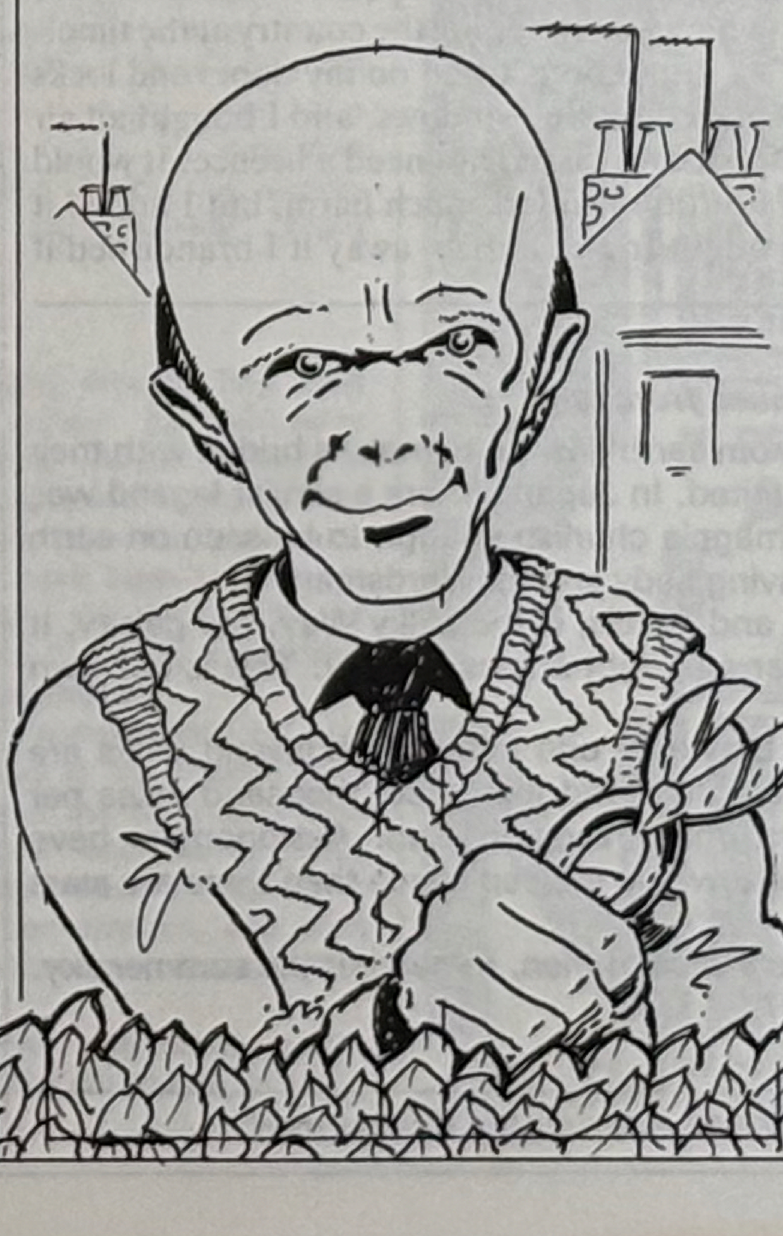
I watched him go up to the bar and take out a bulky wallet to pay for the drinks. The real estate business was certainly profitable, I thought.

As Alfie was putting his wallet away his elbow was jogged heavily by one of a group of boisterous youths wearing black jackets and carrying crash helmets.

The wallet fell to the floor and, as Alfie bent to retrieve it, I saw the youth pick up Alfie's glass, drain it, and replace it on the counter.

I jumped out of my chair and pushed my way to the bar.

'I saw that!' I shouted.



'What did you see, mate?' sneered the youth, hunching his heavy shoulders.

'You stole my friend's drink.'

'You're mistaken, mate.'

The youth's companions crowded round me threateningly.

'You want to watch your big mouth, mate', they cried. 'Bert never touched your friend's drink. Your friend drank it himself.'

The landlord turned round from the till and said warningly, 'I don't want any trouble in here. If you can't behave you'll have to leave.'

Alfie straightened up and looked sorrowfully at his empty glass. Then his piercing blue eyes ranged over the opposition and he said with a shrug, 'Perhaps my friend was mistaken. Another whisky, landlord – in a clean glass.'

The landlord looked at him gratefully, poured another whisky, and took payment for it.

I pushed my way back to my seat and Alfie joined me.

'I was not mistaken,' I assured him in an angry undertone. 'That yobo swallowed your drink while you were picking up your wallet.'

'I know. But what could we do against all that lot? I took the easiest way out. I'm sorry I let you down but I'm not built for a rough house.'

'Perhaps you're right,' I muttered. 'Let's drink up and go. I still think they're out for trouble.'

As we left the pub I saw the youths smirking and whispering among themselves.

The moon was coming up, and it cast eerie shadows through the trees which lined the lane leading back to the housing estate.

'Hurry!' I urged. 'We'd better get away in case those yobos follow us. They may have an eye on all that money you're carrying around.'

We had gone hardly a hundred yards when the youths hurtled past us on motor–cycles. They rode in single file and as each one went by he shouted abuse.

I began to run and Alfie followed my

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example. I feared they might dismount and ambush us but they turned and came racing back again, yelling and screaming.

We had to jump on to the grass verge to avoid being knocked down. Running on the uneven grass slowed us up considerably, and I knew it was only a matter of time before we dropped from exhaustion. Then they would dismount, rob us, and kick us insensible.

As I stumbled forward I heard the bikes slow down behind us and turn again. Seconds later, I heard the engines racing again and the lane under the trees became a tunnel of blinding light.

Alfie put a restraining hand on my arm.

'Is it a game or do they mean us harm?' he asked.

I stopped and looked at him in amazement.

'Where have you been?' I demanded. 'We'll be lucky to escape with our lives.'

Alfie shook his head sadly and said, 'It's up to me then.'

My heart was pounding so hard in my chest that I could not run any further, and so I watched him as he took what looked like a torch from his pocket.

As the first rider approached, screaming obscenities, Alfie pressed the button on his torch.

A slim pencil of green light shone across the road, and the engine of the first speeding machine coughed and died.

The effect on the rider was the same as if he had run into a stone wall. He hurtled over the handlebars and his head smashed into a tree. The sound of his neck braking was like the snapping of a tree branch in a heavy frost.

The effect on the riders behind was catastropic. Within seconds a tangled mass of metal and smashed bodies littered the road.

Alfie switched off the beam and put the torch back in his pocket.

'Let's go,' he said calmly.

I didn't argue. I was beginning to wonder how much more there was to my new neighbour than met the eye.

When we parted outside my garden gate Alfie looked at me solemnly and said, a trifle apprehensively I thought, 'Least said, soonest mended,eh?'

I nodded.

'I didn't see a thing. After all, we don't want any trouble with the authorities, do we?'

'No, indeed. My people wouldn't like it if I drew attention to myself.'

I thought at the time that he meant his partners in the real estate business, but in view of what happened later I wondered.

I wondered too, how he had caused the pile up of the motor–cycle yobos, but he offered no explanation and I did not like to ask.

The following day I had a visit from two policemen. They told me that five motor–cyclists had been killed in a crash and the sole survivor would very likely be exchanging his machine permanently for a wheelchair. Had I seen the accident on my way home from the Three Stars?

No, I said, I left the pub before the motor–cyclists did. The accident must have happened after I reached home.

But wasn't there some trouble at the pub over one of the group allegedly swiping my neighbour's drink?

I agreed, but suggested that it must have arisen out of a misunderstanding.

The same evening, as I was pottering about in the back garden, Alfie's head appeared over the fence. He said,'Thanks for being discreet when the policemen called.'

'Think nothing of it,' I assured him. 'Those hooligans deserved all they got.'

Alfie smiled sadly and said, 'All the same, I wish it hadn't happened.'

'Your head office doesn't like personal publicity?' I asked.

'Not at this stage,' he agreed. 'After all, I'm only an observer.'

At the inquest on the five youths the coroner commented on the dangers of drink and driving and a verdict of death by misadventure was entered.

● ● ●

I had almost dismissed the incident from my mind when, some months later, three houses on the estate were broken into and goods were stolen. The police made inquiries but no arrests were made. It was, after all, only a small part of the crime wave which was sweeping the country at the time.

I had bolts fitted on my doors and locks placed on the windows, and I bought an air pistol which did not need a licence. It would not do intruders much harm, but I hoped it might frighten them away if I brandished it convincingly enough.

It was a week later that the blow fell. I awakened to the crash of breaking glass, jumped out of bed, and snapped on the electric light.

The clock on the bedside table showed 3a.m. As I was throwing my dressing gown on I heard a horrible scream from the house next door. It was followed by another scream and an awful silence.

They've got Alfie, I thought. I snatched up the air pistol and a torch and dashed out of the house. There were lights on next door and the front door was open.

As I burst in I waved the pistol and shouted,'Alfie, are you all right?'

Apart from a bruise on his forehead Alfie was all right, but the two men lying on their backs on the carpet were in a bad way.

Each one had a neat hole drilled in his chest and as I watched in fascinated horror both men began to disintegrate. Within thirty seconds all that remained were two small piles of reddish brown dust on the carpet.

Alfie dropped his torch–weapon into a pocket of his dressing gown and said, 'I'd better get the vacuum cleaner.'

'What happened?' I asked.

'They broke in and attacked me. I had to defend myself. It's all very unfortunate.'

'You mean head office won't approve?'

I felt his electric blue eyes probing my inmost thoughts.

'You know, don't you.

It was a statment rather than a question.

'Let's say I suspect,' I answered.

'You're a shrewd human,' he murmured, as I watched him vacuum the carpet and empty the bag into the dustbin.

:We could co–operate with people like you. Unfortunately, people like you seem to be in a minority here.'

He held out his hand and I shook it warmly. I knew it was a farewell gesture.

He turned on his heel and went into the bedroom. A few minutes later I pushed open the bedroom door and said, 'Goodbye, Alfie.' As I had expected, the room was empty.

I never saw or heard from him again. Perhaps he has been recalled for debriefing. Or he could have moved in next door to you. If you think he fits the description of your new neighbour, treat him kindly and don't provoke him. He hates violence but he's a terror when he's roused.●

STAR CHART

Continued from page 19

7th day of the 7th month. Then the magpies from earth flew up to make a bridge with their outspread wings for the two to be briefly re-united. In Japan, where a similar legend was known, children would throw stones at any magpie churlish enough to be seen on earth on this day, thus shriking in its duty to the Waving Lady and the Herdsman.

Now this river, that runs between Lyra and Aquila, is the Milky Way, our galaxy. It is to be seen on dark nights as a fantastic band of light across the sky. This is our own island universe.

The galaxy is a disc of stars so wide that over one hundred thousand years are needed for light to cross, travelling at one hundred and eighty six thousand miles per second. It contains tens of billions of stars, many like our Sun. Astronomers have detected more galaxies, like our Milky Way, elsewhere in deep space than there are stars in our galaxy. That is a lot of Suns.

So next time you get nervous about the affairs of men, remember the summer sky. What does a drop of water mean to the ocean?

If only we could sail upon it!

(Star map supplied by courtesy of I.P. Sharp Associates Computer).

EXCLUSIVE!

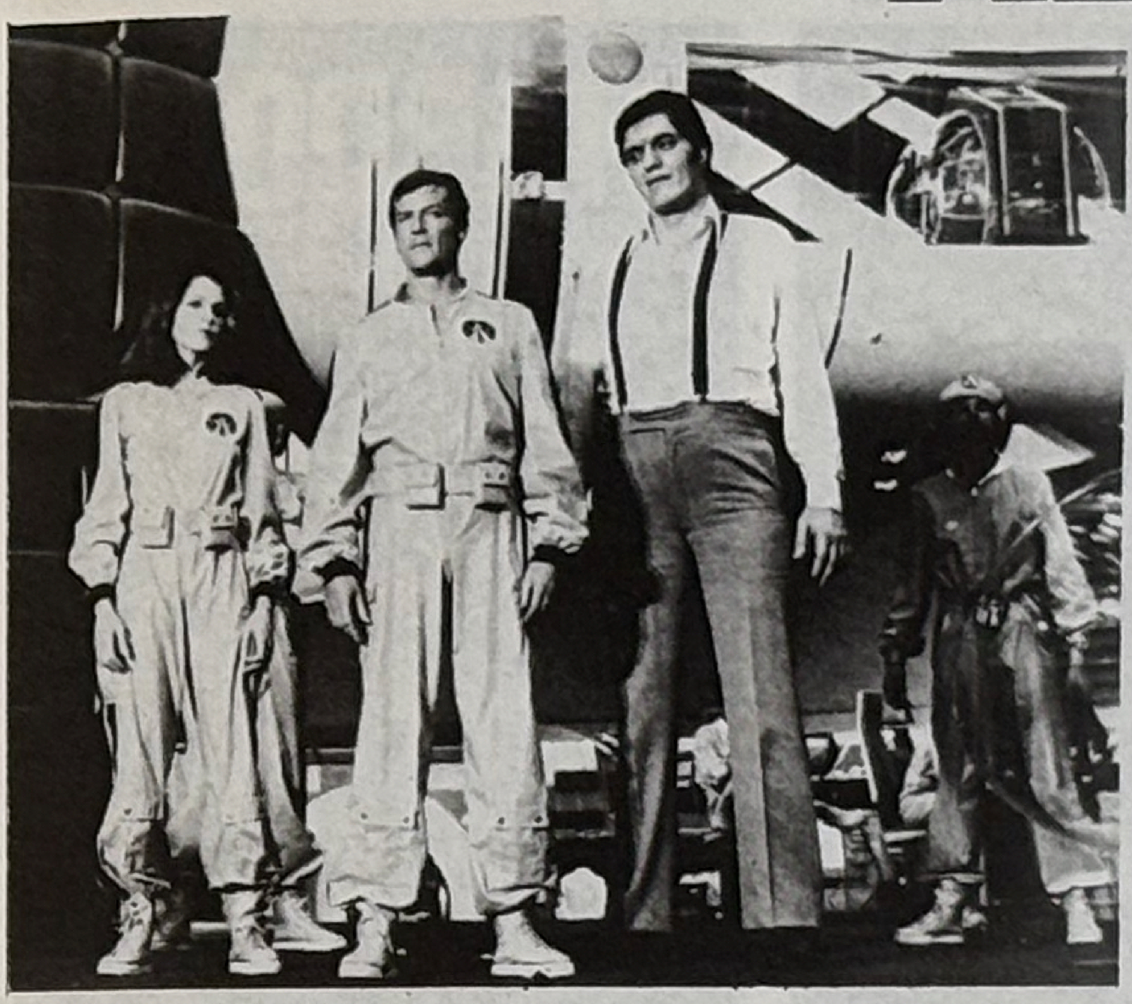
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FILMS



James Bond and travelling companions finally discover that Hugo Drax's empire extends into outer space.



Hobbits and dwarves hide from the unwelcome attention of a 'black rider'.

MOONRAKER. The latest in the long running James Bond series has at last hit the big screen, and is back with the usual bevy of 'Bond Girls' and some stunning special effects.

The boast for this particular Bond film is that it is 'The biggest and most expensive to date', and an equally illuminating statement comes from the director, Lewis Gilbert 'When I first directed films, I used to make an entire feature for less than the 'Moonraker' telephone bill'!

So what has all this incredible expense achieved in the way of making a worthwhile movie?

First, let it be said that the locations and sets are spectacular from the beautiful Vaux-le-Vicomte chateau, the many picturesque locations in Venice, the breath-taking views of Rio, the roaring Iguacu falls, the lost city of Tikal with its pyramid temple and eventually outer space.

Equally, the gadgetry is memorable, especially the Venetian gondola which converts into a motor launch and finally a hovercraft.

As ever, the opening sequence is probably the best part of the whole movie, featuring some quite amazing free fall parachuting.

Roger Moore is his normal urbane self, and is given some nice throw-away lines. Probably, to make up for the very little that he has to do in the way of following any story-line.

Richard Kiel returns as 'Jaws', but unfortunately his appearance loses impact as there is very little that you can do with a set of steel teeth. The writers faced with this problem took the rather dubious way-out of letting him have some love interest.

So the film moves from spectacular location with climax and escape to spectacular location with climax and escape, and when the imagination flags for what to do — send in Jaws.

Eventually, we all end up in outer space, where to quote producer Albert R. Broccoli (whose family brought the broccoli to America) 'The premise of Moonraker is not science fiction, it's science fact.'

It is unfortunate that it is this point where fact becomes total fiction. Evil villain, Hugo Drax, well played by Michael Lonsdale has decided to re-populate the Earth with his own master race. Surely, this idea lacks a certain something in originality, and a space station which has taken 220 technicians eight weeks to build is destroyed in a blaze of incandescent fury complete with aural sound effects!

It seems a pity that a film which is well made and enjoyable to watch should lose some of its edge because the plot and the characters are sacrificed to the special effects department.

Nevertheless, Moonraker will take the gross for the series into a new orbit, and is enjoyable entertainment despite the carping criticisms this reviewer might make.

Lord of the Rings. The long awaited movie by animator extraordinaire, Ralph Bakshi is finally released, and the long wait has been worthwhile because it would not have been possible to have brought this film to life by using actors. Only by his skilled animation techniques.

Bakshi concentrates on two of the books in the trilogy, 'The Fellowship of the Ring' and 'The Two Towers' because all three books would have made for a marathon performance, and even so some people may find this film over long.

However, the range, scope and feel of the characters and their world is brought off in a quite admirable way.

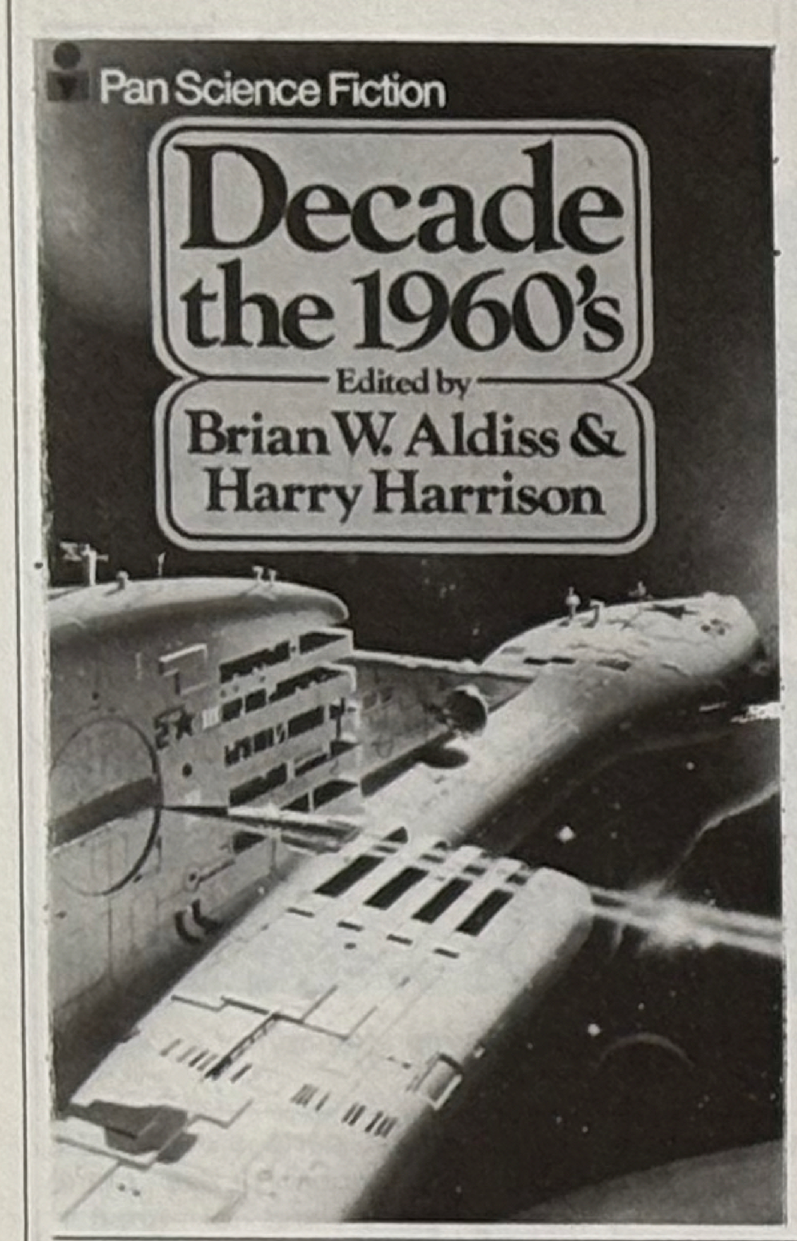
The Humanoid. Based on his success as 'Jaws', Richard Kiel appears in this Italian science fiction film as a superhuman creature who is literally indestructible. The film contains a part of every science fiction film ever made, and scarcely wins any awards for originality.

The best parts are Barbara Bach who probably has more moving parts, and of greater interest than the rest of the movie.

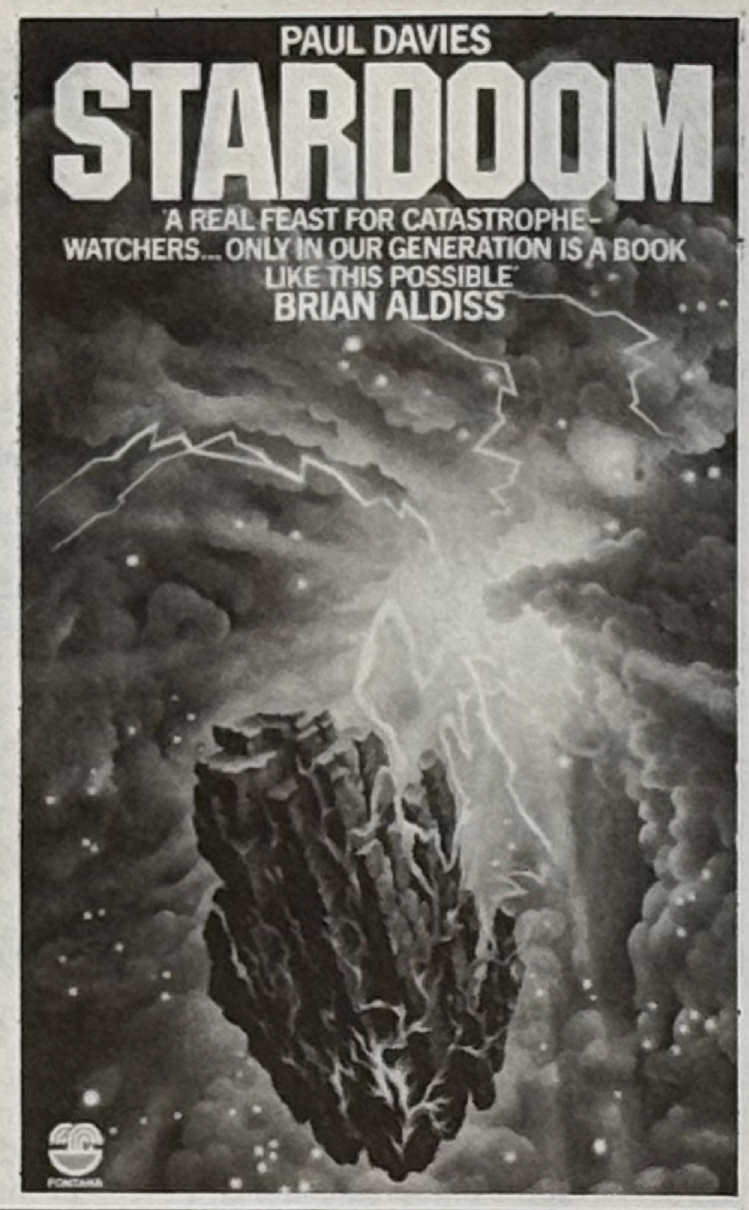
The Shape of Things to Come. This movie is in no way based on the H.G. Wells story, and although it is good to see more SF movies getting into the cinema and onto the circuits, a hint of originality in any sphere would be a blessing.



BOOKS







My Name is Legion by Roger Zelazny, *published by Faber & Faber, price £4.95.*
One of the masters' of science fiction story at the top of his form.

Roger Zelazny has has produced a book for the computer age. As more and more information about people pours into the government's computer banks and into the hands of its agencies, many people feel that it is only a short step for all information to be in their hands for our own good.

This is the scenario which 'My Name is Legion' presents, but there is one exception to computerised rule, and his names are legion.

Obviously such a man is very useful in such a world to clear up the nasty moments in man's existence, and then fade away to where he came from — nowhere.

The book is broken up into three individual short stories which each stand in their own right, but collectively give substance and depth to the character.

Very much a book to go out and buy as soon as possible.

New Worlds for Old by Duncan Lunan, *published by David & Charles, price £6.95.*

Duncan Lunan and the ASTRA group (Association in Scotland to Research into Astronautics) look at the changing face of the Solar System.

In the light of thenew knowledge which the probes and the Moon landings have brought us, this is a very timely book. As Duncan Lunan points out, media interest and hence popular interest faded very quickly, when it was found that the planets were not instantly exciting.

This book will revise that opinion because not only is each planet different, but they are each intrinsically interesting in their own right. The knowledge which we are gaining as each fly past and landing takes place, gives us much needed information about our development in terms of the Solar System and the uses and benefits of our sister planets.

There are also informative chapters by guest writers on such subjects as 'Interplanetary Navigation', 'The Colonization of the Moon' and 'Life and the Solar System'.

The only quibble with the book can be the illustrations used, when there are so many real photographs available.

All in all, a useful book which not only gives the case for continued and manned exploration, but persuades you of its necessity.

Decade the 1960's edited by Brian W. Aldiss & Harry Harrison, *published by Pan Science Fiction, price 90p.*
A panegyric to that eloquent decade when the changing of the times was in the palm of everyone's hand.

The names included in this volume read like Who's who of the science fiction world, and include such stalwarts as Norman Spinrad, Philip K. Dick, Kurt Vonnegut, Roger Zelazny and so on and on.

This is a book which will have at least one story by a favourite author in it, and is a worth while trip back to the days when it was all happening.

Tiger! Tiger! by Alfred Bester, *published by Penguin, price 95p.*
For all those who have not read this classic, Penguin have re-launched it. All that can be said is 'Read it'!

A word in passing should be said for the original front cover illustration which was breath taking, regrettably the new one is not quite as good.

The Philadelphia Experiment by Charles Berlitz and William Moore, *published by Souvenir Press.*
This book is sub-titled 'Project Invisibility', and concerns that well known occasion when the U.S. Navy made one of their destroyers disappear and then reappear in another place.

It has all the ingredients which make such a book so convincing, a total denial by the U.S. Navy, a complete lack of documentary evidence and especially no witnesses.

With a scenario like this, what other conclusion can be drawn other than the fact that the whole thing must have taken place, and is yet another example of the perfidiousness of those people, who for reasons best known to themselves, are keeping all this amazing knowledge from us.

My Lord Barbarian by Andrew J. Offutt, *published by Magnum Books, price 95p.*
This book is strictly a sword and fantasy saga, concerned with the normal strivings of an untamed barbarian to overcome all forces and odds set against him.

As an intellectual concept, it is unlikely that any single barbarian, no matter how handsome and muscular, could achieve as much as they have done in their fictional role. But such is the stuff of heroes.

However, it is an exciting and fast moving story, and should please the afficionadas of the genre.

The Status Civilisation by Robert Sheckley, *published by Penguin Science Fiction, price 75p.*
The Status Civilisation is a most enjoyable novel by an author who has an established reputation which is not perhaps as influential as it should be.

The story concerns Will Barrent who is convicted of murder, and shipped to a prison world which is administered by the prisoners.

On the prison planet, he finds that life and its customs are the dark side of the existence we are all used to.

The book apart from being very funny is a salutary lesson in the veneers of civilisation which govern all our lives, despite its reissue from 1960.

An Infinite Summer by Christopher Priest, *published by Faber & Faber, price £5.25.*
Christopher Priest is one of Britain's important science fiction authors, and his latest book bears out this title.

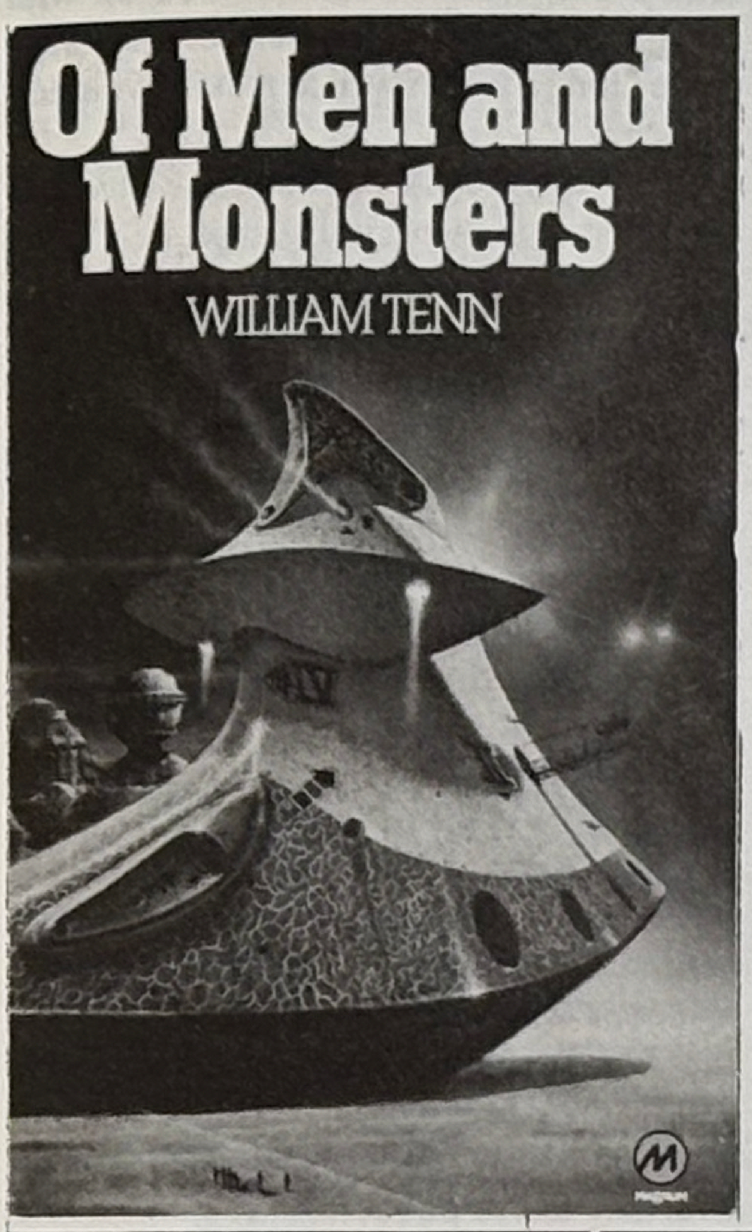
The book consists of six short stories which are all loosely linked to the idea of time, and its effects on the various protagonists.

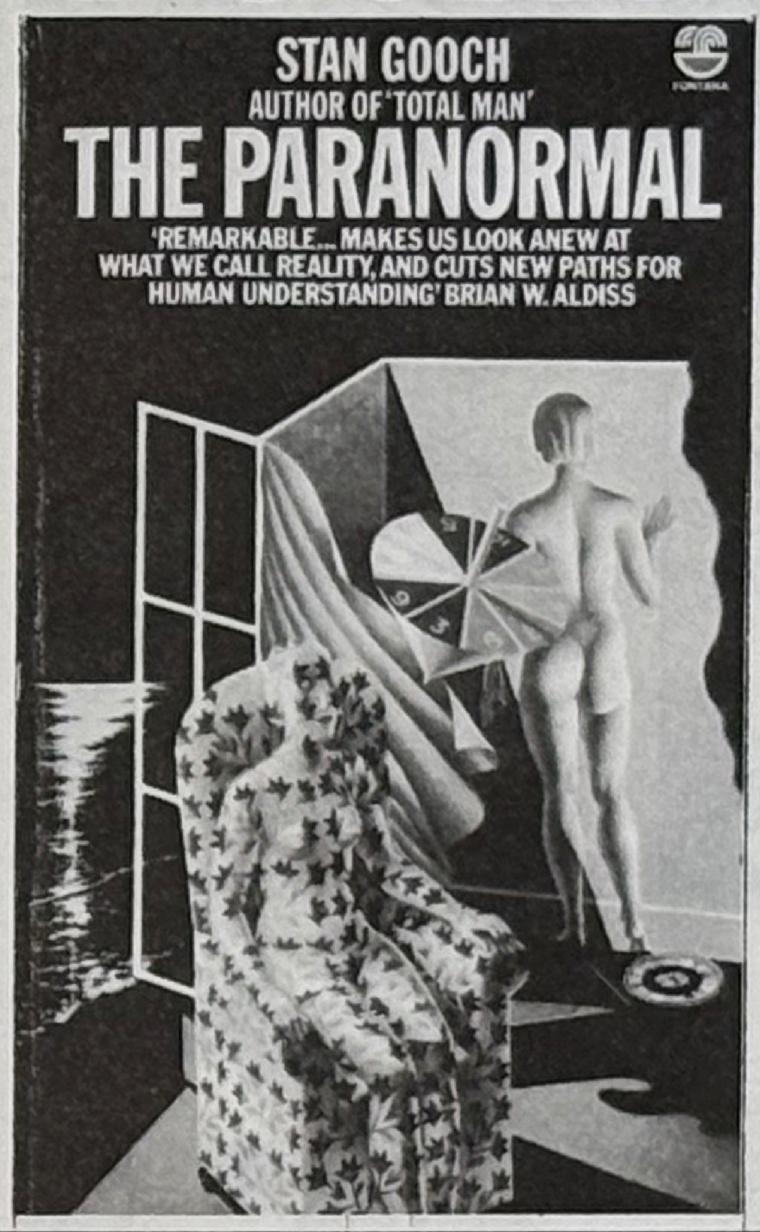
It is perhaps not the easiest book to read as you may well end up with a certain feeling of unease, but for all that, an interesting experience.

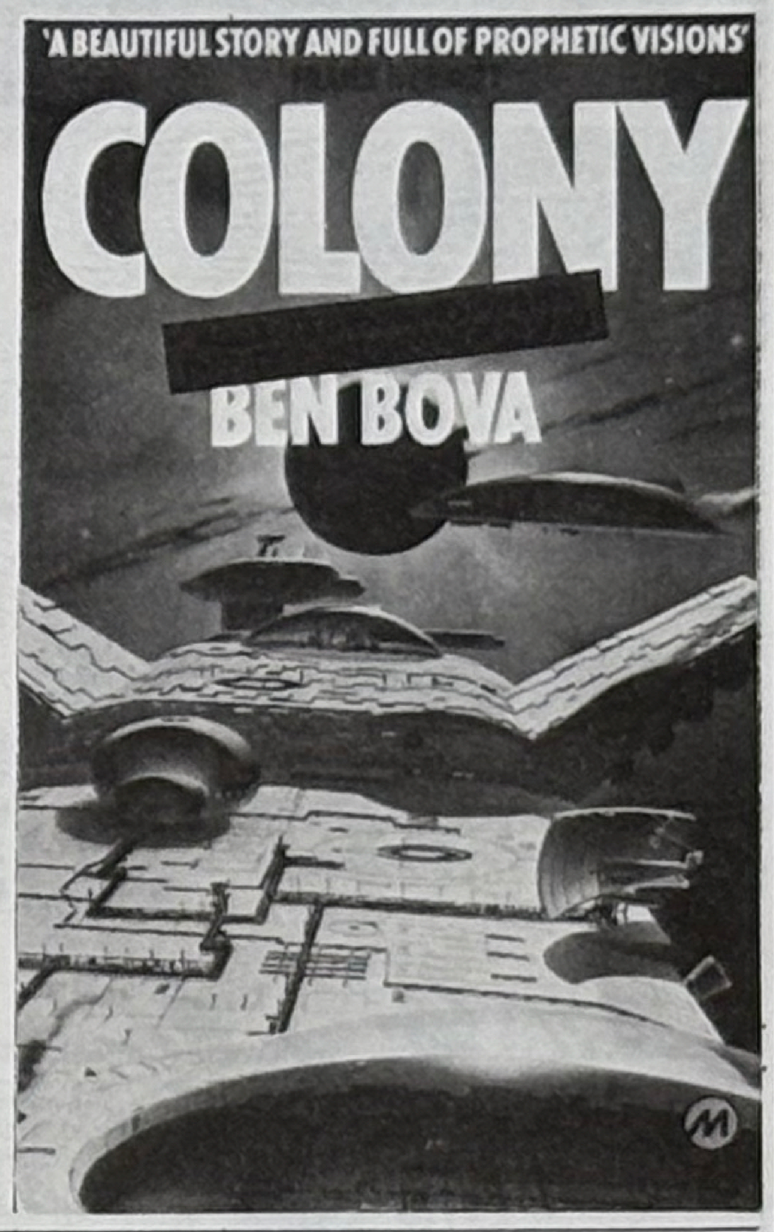
Colony by Ben Bova, *published by Magnum Books, price £1.35.*
Ben Bova is connected with a magazine called Omni, and unsurprisingly we find an enthusiastic review for this novel contained in the pages of 'Colony'.

It could possibly be worth a Hugo award that despite these connections, he has turned out a very good book.

BOOKS







The story ranges through the significant factors which make up the problems facing Earth, and at the same time is very exciting.

It is a book which calls to mind other classics such as 'Stand on Zanzibar' and 'The Sheep Look Up', and deserves to gain as wide a readership and reputation.

The Paranormal by Stan Gooch, *published by Fontana, price £1.50.*
A rarity in books of this kind, a sensible one.

Stan Gooch takes all aspects of the paranormal, and in interesting and informative chapters gives a break-down of not only their good points but also the bad.

With a refreshing innovation for this type of work, the fundamental basis of various phenomena is explored and explained convincingly.

A book to impress the unconverted, and to top it all he can also win at gambling thanks to his psychic abilities!

Of Men and Monsters by William Tenn, *published by Magnum Books, price 95p.*
A particularly interesting and enjoyable book, which keeps you guessing from its opening paragraph to its ultimate conclusion.

The main skill in the weaving of the plot is that your guesses as to the ultimate conclusion are always wrong, but at the same time you find yourself racing through to find out exactly what will happen.

A much recommended purchase.

The Ley Hunter's Companion by Paul Devereux and Ian Thomson, *published by Thames & Hudson, price £6.50.*

Everyone who found the article by Paul Devereux in this edition interesting will find that this book is an invaluable addition to their knowledge of this often 'mysterious' but always fascinating subject.

The book is split into two parts, and part one presents the authors' findings and evidence about ley lines. They also discuss the connections between these sites and other phenomena.

An interesting and well reasoned section which always gives the reader cause to think.

Part two is a mapbook and guide to leys from all over England. They average ten miles in length, and have all been walked by the authors.

It is conceivable that you could get as much enjoyment from this book by walking some of the suggested routes. A look at some of the more beautiful and unspoilt parts of England is always a worthwhile experience, and from first hand experience could come agreement.

Stardoom by Paul Davies, *published by Fontana, price 95p.*
A scientific and readable account of cosmology from its primeval beginnings to the ultimate and irrevocable end.

A book which takes a vast and awesome subject and reduces it to an understandable and interesting scale, but the end is nigh — eventually!

When the World Screamed by Sir Arthur Conan Doyle, *published by Pan, price 80p.*
It is always interesting to read something different from the creator of Sherlock Holmes; This collection of short stories ranges from the science fiction of Professor Challenger to basic boxing adventures, they are all enjoyable in their own right and give light enjoyment after some of the heavier tomes which abound.

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The skill and the humour which so enhance 2000 A.D. are amply demonstrated in this end sequence from a 'Judge Dredd' story. This comic seems to be able to bridge the gap between fantasy and reality with a 'child-like' ease.

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There are usually five stories a week in 2000 A.D. and lately all of them have been excellent. Judge Dredd is the main series, Dredd himself being a kind of unambiguous, dark, firm but fair upholder of 21st century justice. An increaseingly complex and decadent society calls for a simpler and more expedient form of justice which is provided in the guise of shadowy judges on huge motorcycles, loaded up with weaponry and sanctified by the power to dispense instant justice wherever it may be required.

There have been two long Judge Dredd series. The first ran for half a year and was called 'The Cursed Earth'. As far as imaginative writing, block–busting scripts, sudden twists and turns, unexpected encounters, wacky way–out protagonists and sheer cliff–hanging excitement goes, it was the best that British comics had ever seen. But even more than that, it was illustrated by the best comics art seen anywhere in years.The two main artists who worked on it were Mike McMahon and Brian Bolland. The former is a real original and the latter has somehow managed to finally transcend all the old problems plagueing British artists working in the shadow of the American product – namely, lack of confidence and the indecision about whether or not to imitate. Brian Bolland seems to have just stuck his tongue firmly in his cheek, jammed a great thick rapidograph in his fist and slammed down the goods. His work is concise, inspiring and best of all, funny. His covers for 2000 A.D. have all been as good and sometimes better than the early superhero covers that Marvel produced: big, stunning pictures full of confidence and over–statment.

I have to restrain myself, writing about this comic, but it's difficult when a series like 'Robo–Hunter' by Ian Gibson and T.B. Grover made me go 'ooh', 'gosh', 'yippee' all the way through. It made me chuckle, slap my thighs, guffaw, rush over to unimpressed non—comic lovers and try to impress them. Ian Gibson is the greatest, that's what I really want to say. But to be more technical about it, he has a grace and surety about his drawings that I haven't seen since Barry Smith's Conan, which it beats, simply because it's less cluttered up with greatness somehow– it never forgets to move along a bit, as well as making you stop and stare.

Pat Mills is 2000 A.D's best writer, but only just. He wins it because he's a bit funnier than the others. 'Ro–Jaws Memoirs' was full of laughs and touching encounters as Ro–Jaws, the robust sewer robot, chewed his way through a very Victorian—looking London sewer system (some things never change) meeting all kinds of oddballs on the way, and eventually finding and then losing true happiness in the uncritical arms of a child. Mike Dorey's art matched it perfectly: shadowy, unromantic, summoning up images distinctly Dickensian in effect.

The main strength of 2000 A.D., however, is the editing. The balance of action and pathos is so fine that only someone with, let's say, an outside view of the human race could have achieved it. Tharg ('The Mighty') is the Editor, and one who obviously understands that control over any Earth publication requires a total respect and cringing obedience from its readership. You'll never find Tharg answering his humble readers letters with phrases like 'it's you guys who really control this mag...' or 'we'd be nothing without you...' Well does Tharg understand that Earthlet readers must be told what they like, otherwise a comic will never get anywhere. Tharg makes no promises and Tharg makes no mistakes – his art and script robots might, but then they can always be deactivated.

All the same, I have certain doubts about the future of this comic. The problem is, we can never really be kids again, only pretend to be. And much as I love this comic, I have a sneaking suspicion that it's really the adult in me that gets such a kick out of it.

I also hope that 2000 A.D.doesn't become too successful with the critics and the fans, but maybe that's inevitable in these 'enlightened' days. After all, this piece may well be contributing to just such an intellectual quagmire, from the depths of such cultural swamps have come the gurglings of such monsters as 'rock operas' or 'pop art'.

Really, when you come down to it, this is the mistake that the 'serious' comics artists and writers make. They think that they can 'lower' their talent to Division Two (i.e. comics) and raise it to levels that will be respectable to Division One of the artistic world. The mistake is that comics aren't in Division Two in the first place, they're in a field of their own.

This is why the majority of the glossy, cofee–table 'comics' will always look like second rate books and comics (like 2000 A.D.) will always look like first–rate comics. ●

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which its humanness could be known and experienced. The measure of his own status as a human being, explained Hunter, was the extent to which his primitive instincts and animal needs had been objectified and ritualised in the gun and the hunt.

Fantasma nodded eagerly in reply throughout his laboured explanation. She loved the sound of his voice, which was dry and harsh. Of what he said she understood not a single word. She was quite ignorant of semiotics, symbolics, analogical aesthetics and all the other arts. As with all her kind, she believed only in primal magic. She was not superstitious.

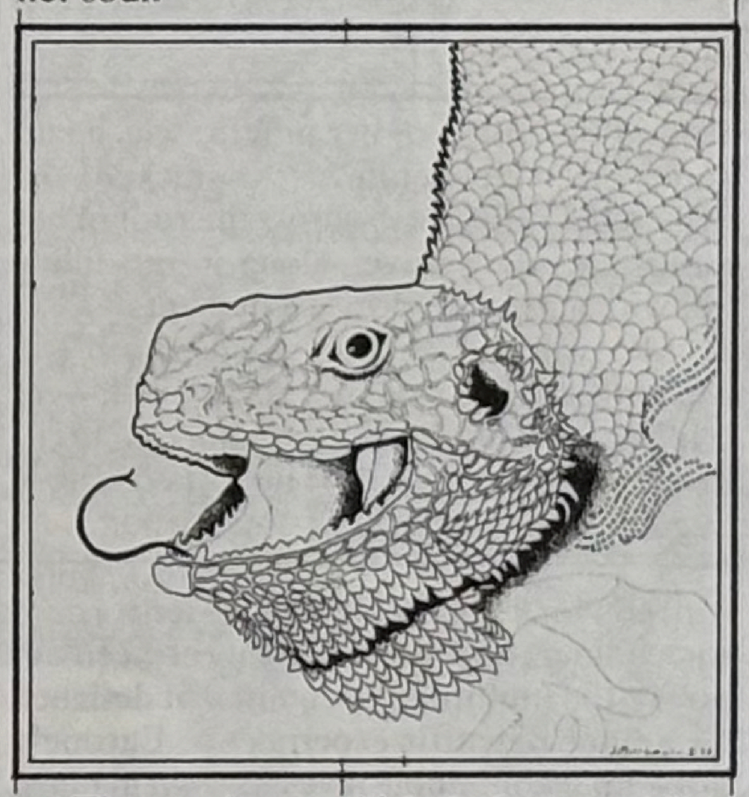
On another day, Hunter killed a poison batrachian which emerged from a pool beside which they rested. It took more than one shot, for the creature had the advantage of surprise, and Hunter had to refocus the laser to fire at point blank range. The first shot merely drilled a hole through the creature's flank, but the second blasted through the gaping mouth and exploded the atlas vertebra. Fantasma was surprised by this revelation of fallibility, but she did not lose her faith in Hunter. It would be different, she thought, when they found the moloch.

But the moloch proved extremely difficult to find, Hunter lost count of the days, and as he felt the cancer growing inside him, the flesh of his bones perishing because of the savage sun and the ravages of the jungle, he became gradually more desperate. He did not fear death, but he feared debility – a descent into a ruinous helplessness where life might remain but strength and sense would not. He needed more than anything he had ever needed before to find the moloch, to consummate their marriage within destiny's scheme with a brief orgasmic encounter when one or the other had to die.

Hunter was not a patient man. Fantasma, on the other hand, was not merely patient but fatalistic. Believing as she did that time, in some greater reality, ran from future to past she knew full well that everything appointed by the unknown gods was already assigned its place and occasion, which no desperation could change. When she attempted to explain this to Hunter he became resentful, believing that she was prevaricating and giving less than her utmost to her duty. In consequence, he begun to ill–use her. Often, while they wandered by day, he struck her with his fists. Each night, when they rested, he would whip her until she bled with the steel buckle of his belt. He would not let her tend the wounds with her many healing ways, and they began to fester. In the meantime, she continued to tend his wounds with devotion, and to serve as his mistress in whatever fashion he chose.

But all this was a phase. which ultimately passed. When he had heaped enough cruelties upon his tender guide to please his will he recalled that she was, after all, his only hope. Slowly, his anger ebbed — but not his anguish. Without Fantasma, Hunter knew, he would be utterly given over to the processes of tumerous growth and parasitic waste which held the forest entranced. As things were, he began to think of himself as being like the trees, maintaining only a slender heart of life while layer upon layer of his surface rotted and died upon him, providing a matrix for the growth of other species.He saw, in the discoloured sores which patterned his skin, the lilies and the berries and the orchids and the deathcaps which dressed the trees, and he imagined his body becoming a world — his organs shrivelling into island continents rimmed by oceans of blood and lymph.

So the futile orgies of flagellation ceased, and his relationship with Fantasma matured. He gave up, by degrees, his cloacal fascination, and became quite passive in their lovemaking. By day he followed and by night he lay back while she adressed his wounds and his penis, sucking his semen into her womb. There, although it could not fertlise an ovum, the substance of his flesh was absorbed into hers, drawn into the reta mirabile to nourish her heart and her soul.



The madness which lurked, crablike, around the floor of Hunter's head began to play games with the softest, most primitive part of his brain. The cells, free of control, rejoiced in mutation and innovation and excess – altering the pale grey tissue, awakening electrical and molecular factors which had never been intended by evolution to reach the levels of consciousness. Ghosts walked in Hunter's dreams and infiltrated his waking mind, vying for possession of him with the images created in him by the signals of the outside world.

He became, in a terribly literal sense, two men. One, the hunter, he had always known as his true identity. The other was a dark chaotic twin of entropic force which reminded him that every molecule of every human form had once been slime on the ocean floor and would be again.

Slowly and surely, the dark twin edged into his consciousness was free in his mind. His rational self still operated his thoughts and directed the actions of his limbs because the chaos had no ambitions in this regard – but in what he was, in the way he experienced himself, he was profoundly changed.

Fantasma, through her powers of empathy, witnessed the changes and understood. Knowing that her own perception of the order of events was backwards, she knew that what she saw was the forming of Hunter's being by the unknown gods, the bringing of certainty out of innocence. In the meantime, the innocence, and the infusion of godliness, were the inevitable corollaries of the killing of the moloch that had been mapped by destiny. She herself, she thought, had also been prepared for the climax. She had passed the stages of growth – the pain of the whip and of the unnatural copulation had been a process of purification. The whip had seared her flesh while the hot fire of the alien's weapon had filled her inner being, probing like a hot spear, preparing for a phase of peace and life and ultimate birth. And all the while, the unknown gods were dragging her back, and Hunter with her, to some focal point, some evelike lacuna in time, from which it had all in reality begun and where all their dream memories would be true.

It was by night, eventually, that the crystal moloch revealed itself. It had stalked them for a day. Fantasma had been aware of its nearness but Hunter, consumed with madness and fever, had not. But with the darkness came peace, for Hunter, and clarity of mind. Then Fantasma told him to be ready, that the jewelled dragon, hunting its hunter, would try to claim its prey in matter of hours.

Instead of making a shelter for Hunter to sleep, Fantasma built a platform supported by two stout branches, overlooking a small clearing. There, amid flowers and thorns, he would wait, cradling his rifle in his arms. She prepared for herself a pallet of moss in the centre of the clearing. There she would lie, pretending sickness and death, for even a flesh eater as powerful and invincible as the moloch prefers to scavenge for carrion when the opportunity is there. Carnivores do not suffer the human sin of pride.

Above the canopy the sky was full of stars, but their light did not reach the forest floor. Fantasma, lit no fire to dissuade the great lizard or make him cautious. The only light that Hunter would have to guide his aim would be the light of the moloch itself – the glow innate within its coat of precious stones. That light was not bright, but in deep darkness it ought to demarcate the creature well enough, and he would see the eye as a shadow among tiny scintillae.

The moloch came, in its own time, as silently as any creature of the Tartarean forest, gliding between the trees with an easy, sinuous grace. From nose to tip it measured thirty metres, but the greater part of that was the long tapering tail. Its body was lightly fleshed, its bent legs carrying the main bulk so that the belly was half a metre above the ground. Its motion was wave—like, the head moving one way and the other while the tail writhed and lashed – the amplitude of each wave grew as it passed back along the spine.

Its head was the size of a man's torso, but its brain was the size of a walnut. Its jaw like the mouths of most of the vertebrates of Thanatar, was dislocated, so that it could swallow a pygmy whole.

Hunter watched it come. at first obscured by the trees so that it seemed to be a rainbow mist drifting on the wind. So faint was the glimmer in its scales that he would have dismissed it as an illusion had he

Continued on page 32

Continued from page 7

not been prepared.

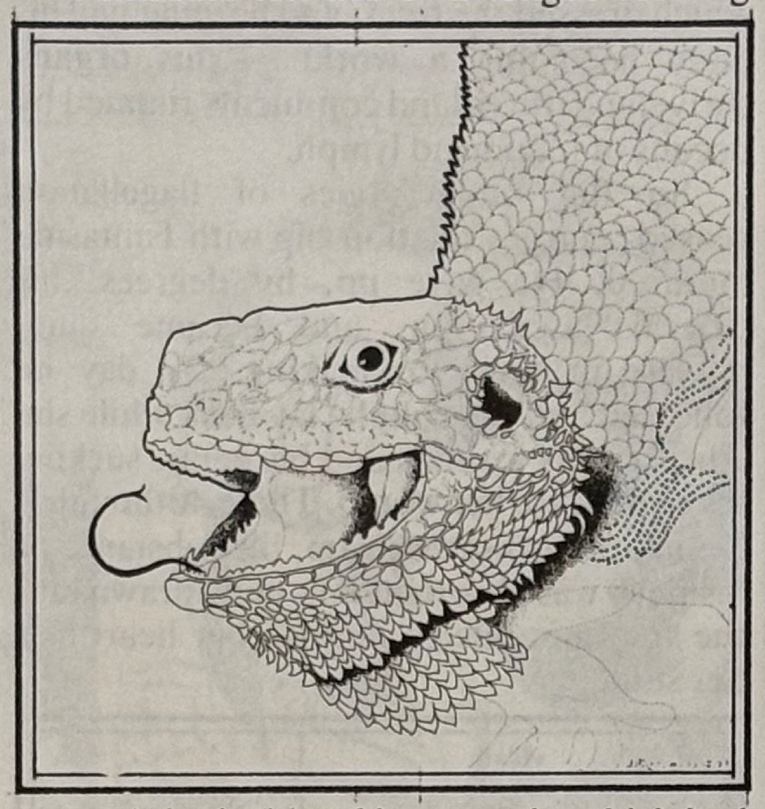
As it came between the trees into the clearing, head raised to taste the air for the fragrance of human sweat, Hunter found fear growing in his mind, and felt the dark twin stirring. He fought for self–control, trying hard to impose some order on the kaleidoscope glitter of the scales. He could not find the eye, and was not even sure of the head, and the demon self seemed to flow like liquid through the perverted image, forbidding it to coalesce.

The moloch paused at the edge of the clearing, but the waves passing along its body did not pause. While the movement continued Hunter could see only confusion. Like amoeboid protoplasm the jewel–scales streamed and swam, colour without form.

Hunter raised the lasar rifle, putting the butt to his shoulder and sighting along the barrel. His left hand manipulated the focus, but uncertainly, while the right tensed, the trigger–finger ready. But there was no sign in the protean chaos of the circular space that was the corridor into the brain.

Fantasma, by contrast, could see the moloch clearly. To her, there could be nothing more solid, more absolutely sculpted, than the incredible sheath of jewels which dressed the monster's frame. She could see the eye with perfect clarity. And she could see too the mind behind the eye – the tiny cold carnivorous thought which impelled the creature to approach her. She could see the rows of teeth – countless glass daggers – which rimmed the tight jaw, although the mouth was open only the merest crack. Hanging slackly between the teeth was the black forked tongue,thin and ribbonlike. The moloch was a female.

Fantasma felt her own tongue running



around the inside of her mouth, which had gone dry. Deliberately she flicked the ribbon back and forth across the roof of her mouth, sending waves along it and filling her with a masturbatory excitement.

She watched the head come closer, still weaving side–to–side as if the moloch were feinting, trying to confuse her as to its intentions. She lay still. The forked tongue began to curl in lascivious anticipation.

And then, at the climactic point – the last possible moment – Hunter brought form out of the image in his hand, froze the dancing lights into stillness, and discovered the eye hiding in the flickering surface. With a single fluid action his left hand focussed the beam and he pressed the trigger. The needle of light drew a thread between hunter and prey, and the red ray found and burned the tiny brain.

The moloch died instantaneously, frozen where it stood in convulsive rigor.

For a second, or perhaps a little more, Hunter did not quite know whether the kill was clean enough. He waited for the light within the gems to fade. But the seconds passed, and the faint, many–coloured light remained. In time, daylight would expose the pelt in all its astonishing beauty.

Hunter descended from the tree, but something had gone out of him with the ray of laser light, and every step he took sent multiplying ripples of pain through his body. The chaotic twin, unchallenged now, was growing inside him, being born.

He fell to his knees before he reached the pallet. Fantasma, came to him and tried to bear him up, but she had not the strength. His sight was gone and he could not reach out to touch his trophy. Instead, he sank to the ground, and lay still. Fantasma leaned over him. There were tears in her eyes although she hardly knew what species of emotion possessed her. With her fingers, she closed the lids over his coal black eyes. And then for the first time, she kissed him.

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continued from page 31

lifting 400 tonnes into orbit. Such behemoths would probably comprise ballistic two—stage launchers weighing 10,000 tonnes at launch. They would not be designed to fly back to Earth like the Shuttle, but rather to decent on ballistic trajectories, slowed at the last minute by engines situated around the outeredge of their blunt aft section. Boeing have already designed a freighter capable of supporting all the requirements of a Solar Power Satellite programme.

If SPS designs are not adopted by the 1990s, NASA will need a space transportation system based on economics rather than gross lifting potential. There is considerable room for improvement with the system now about to come into use and a post–Shuttle launcher offering even better operating costs will go a long way toward building a permanent manned flight capability. While the Russians place their future hopes on long duration space stations, NASA is more concerned to fashion the space vehicles of the future around needs as they arise. Where once it was thought desirable to place large manned space stations in orbit, scientists now propose smaller vehicles tailored to specific tasks.

First in that field is Spacelab, Europe's entry ticket to the arena of manned flight. Built by a group of companies led by Germany, Spacelab will be carried in the Shuttle's cargo bay, providing work space for scientists and specialists. It will not be capable of free flight, depending upon the Shuttle Orbiter for the oxygen and nitrogen it needs for habitability, the water it needs for cooling, and the electricity it needs to power the multitude of equipment designed for unique scientific experiments. Europe's hope for a continuing investment in manned space flight pivots on the development of a successor to Spacelab, a free–flying laboratory similar to conceptual studies of habitability modules Grumman propose could be attached to an External Tank for limited construction tasks. Spacelab will make its first flight, secured throughout the mission to the Orbiter cargo bay, early in 1982 with one member of the crew from Europe. NASA will use Spacelab for many scientific tasks in the coming decade, using a second laboratory soon to be ordered.

But space station activity aboard Skylab, the large orbiting facility launched in 1973, has already shown the promise of new medicines, vaccines, and other chemical preparations impossible to prepare in the gravity field of Earth. Materials for semi–conductors, new alloys, and metals unlike anything yet developed may emerge from large space factories that could present the major space challenge at the turn of the century. Laboratories like Spacelab will be mere precursor research facilities for the colonies of another century. If industrial activity in space can be achieved within the forseeable future, Earth could rid itself of the prime source of heat escaping to the amosphere and heating our planet to a level where climatic and enviromental change may prove catastrophic.

Within the past century, carbon dioxide levels in the atmosphere have more than doubled, sure sign that planet Earth is diseased to danger point with pollutants and chemicals no atmosphere should be expected to counter. Sceptics say Earth can look after itself, that scientists underrate the planet's ability to accomodate major changes. Thoughtful caretakers would look carefully at the sudden emasculation of the fertile Earth and question the wisdom of driving so many harmful processes into the atmosphere. It may turn out that our scramble for prestige in the corridors of space will give us the tools to prevent the planet dying from over–pollution and over–population. Carried to the ultimate, laboratories like Spacelab, and the space factories of the future, are mere steps toward giant colonies the size of large cities in which several hundred thousand people would be born, live and die. With Earth powered from giant solar cell platforms, factories producing more efficiently the products for work and pleasure, and giant colonies between Earth and Moon. Man will have truly become a cosmic being.

The things we do in space for the remainder of this century are as important as the first machine tools on Earth, for they herald a new era of space industrialization unparalleled by anything we can properly conceive today. For the first time, the future is clear. If we fail to invest in the new tomorrow, or shy from breaking the umbilical that connects us to Mother Earth, the bond that links us with the past will be meaningless. For it will all have been for nothing. Across a million and more years of evolution we have progressed to a new beginning with promise for unlimited expansion and growth beyond constraints of Earth. There will never be a greater opportunity for mankind.●

FRANK FAZAKERLY

SPACE ACE OF THE FUTURE!

EPISODE 5 = "SPACE-THE FINAL FRONTIER"
RESUMÉ: THE FAZ & ZELDA BRAITHWAITE HAVE ESCAPED FROM THE BARREN, ROBOT-RULED PLANET OF EARTH: 3500 AD BY STEALING THE CHROME QUEEN'S FLAGSHIP!
Now Read On...

THERE GO THE PURSUIT CRAFT. I'M SORRY SUCH A THING SHOULD HAPPEN DURING YOUR JUBILEE VISIT, YOUR HIGHESS, BUT...

BANG
POP
KRACKLE
FOOOSH!
WIGAN PIER

NO EXCUSES! FAILURE IS NOT TOLERATED!
B-BUT FRAZZzzz

APPOINT A NEW MAYOR!
HMM... I MAY HAVE A USE FOR THIS FAZAKERLY HUMAN... BUT NO! HE MUST DIE. IT'S MORE EFFICIENT THAT WAY!
ROCKETSHIP KIMOTA PASSING LUNAR TRACKING SATELLITE #508 NOW YOUR CHROMENESS.

ZELDA? WHERE DO YOU... ER... "WOMEN" COME FROM?

THE ROBOTS KEEP MALE AND FEMALE WORK UNITS IN SEPERATE DOMES AFTER PRODUCING US BY ARTIFICIAL INSEMINATION. IT SUITS THEM TO KEEP THE SEXES SEGREGATED FOR UTILITY.

I'M FROM THE ST. HELENS DOME...
I MADE IT TO WIGAN VIA THE EAST-LANCS TUBE--WAY AFTER A SHOOT-OUT WITH THE ROBOCOPS.
WHAT'S A "SEX"? AND THIS "ARTI--FICIAL INSANITATION?"
NOT RIGHT NOW, FRANK.
'ANG ON. WHERE'S TH' BOG? I'M DYING FOR A...
GOOD GRIEF!! THIS IS A ROBOT SHIP! THERE'LL BE NO TOILETS ON BOARD!
EVEN WORSE -THERE'LL BE NO FOOD! I'M STARVING!

NO TOILETS?
NO FOOD?!
NO ASPRINS!
NO LASERBLADES!
WHAT ARE WE GOING TO DO?

MEANWHILE-BACK IN WIGAN
WISUAL CONTACT ESTAB--LISHED!
DESTROY!
NOW!

PREPARE TO FIRE!
RODGER!
RODGER!
5-4-3-2-1-

BRAINSTORM STUDIOS

FF#5 ©BRYAN TALBOT 1979

DON'T MISS THE NEXT THRILLING INSTALMENT = "FAZAKERLY AT BAY"!!!

APOCALYPSE in: THE GERM WARS

PART FOUR.

ALIENS ARE PLANNING TO BOMBARD APOCALYPSE'S PLANET WITH GERM BOMBS SO THAT THEY CAN CLAIM IT AS THEIR OWN.

ONLY APOCALYPSE, DUE TO THE EXPERIMENTS THAT CREATED HIM, IS IMMUNE.

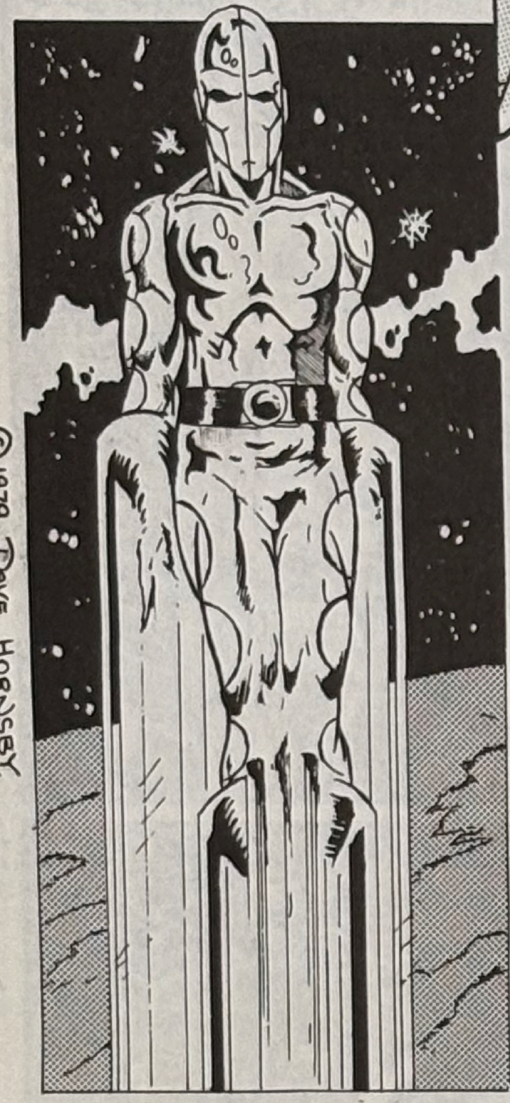
NOW HE HURTLES TOWARDS THE ALIEN CRAFT.

THERE IT IS!

INSIDE...

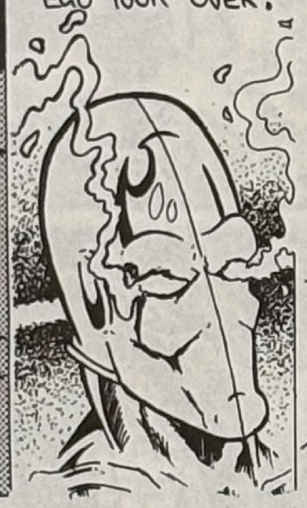
SIR... THERE'S A HUMANOID FLOATING IN SPACE!

SIR! HE'S COMING RIGHT AT...

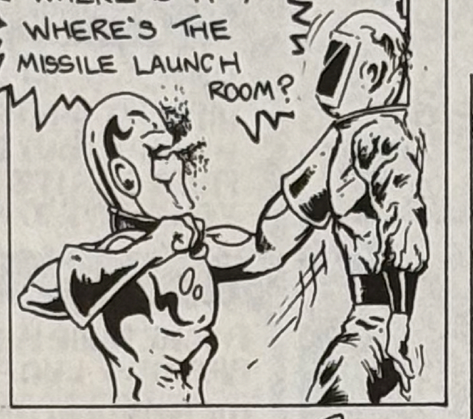


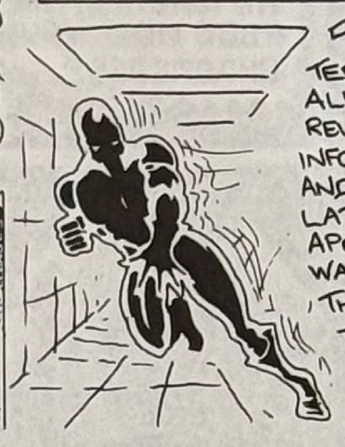
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EVEN AS THE CABIN AUTOMATICALLY SEALED ITSELF A STRANGE CHANGE TOOK PLACE WITHIN APOCALYPSE! HIS EYES BEGAN TO GLOW AS HIS VIOLENT ALTER EGO TOOK OVER!



WHERE IS IT? WHERE'S THE MISSILE LAUNCH ROOM?





THE TERRIFIED ALIEN REVEALED THE INFORMATION AND SECONDS LATER APOCALYPSE WAS RACING THROUGH THE VAST ALIEN SHIP!

NOTHING COULD STOP HIM. HE REACHED THE ALIEN COMMANDER'S QUARTERS AND...



RRIIIP!

I DON'T KNOW WHO YOU ARE BUT YOU CAN'T STOP US... ONCE I PRESS THIS BUTTON YOUR PLANET IS DEAD!



APOCALYPSE STARTED ACROSS THE ROOM BUT HE WAS TOO SLOW! THE ALIEN'S YELLOW FINGER PUSHED THE FIRE BUTTON AND TEN MISSILES SPED TOWARDS THE PLANET BELOW!



CONTINUED.

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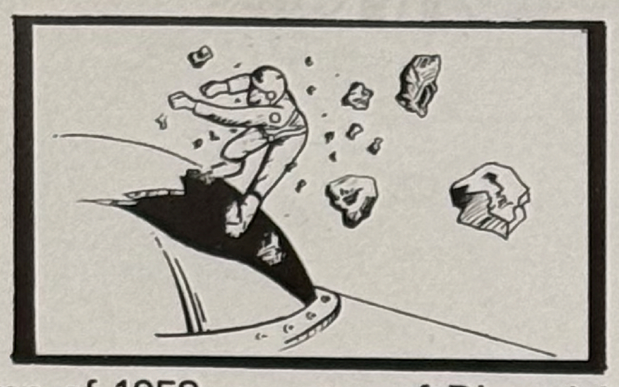
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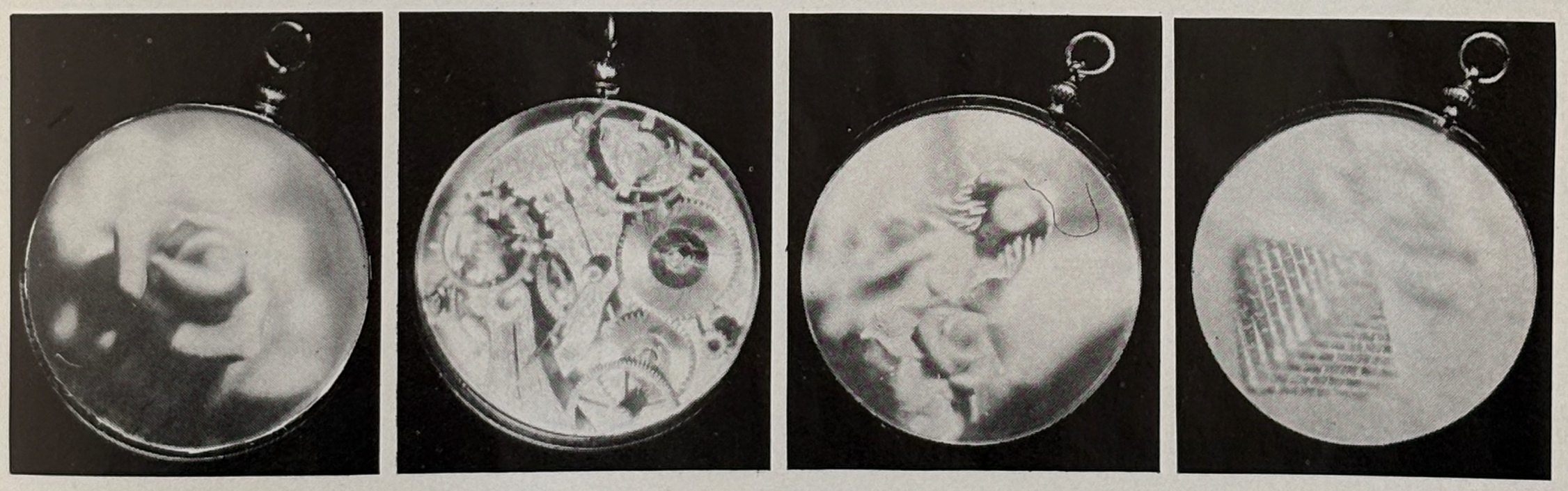
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